

# Klan Trial

## Defense

### Charlotte Ends Case

#### Observer Ballistics Testimony

#### Disputed, Defended

4-5-84 Associated Press

WINSTON-SALEM — Attorneys for nine Ku Klux Klansmen and Nazis rested their case Wednesday in a federal civil rights trial stemming from a 1979 Greensboro rally that left five demonstrators dead.

Prosecutors began offering rebuttal evidence late Wednesday in the 12-week trial.

FBI agent Bruce Koenig, who did sound analysis on gunshots fired during the rally, returned to the stand and said he stood by his earlier testimony that 39 shots were fired at the rally.

"I am not wrong in this case," said Koenig, supervisor of the FBI tape analysis bureau, during cross-examination by Greensboro attorney Harold Greeson, who represents defendant Coleman Pridmore.

Koenig said University of Florida Prof. Harry Hollien's analysis of the gunshots was not correct. Hollien, in testimony for the defense, had disputed Koenig's claim that 39 shots were fired.

Koenig said Hollien used a filter when he ran the sound of his test firings through a machine that prints the sound waves. Koenig said that caused Hollien to miss some high-frequency sounds generated by the gunshots.

Earlier, in the final day of defense testimony, Charles Manning, a Raleigh engineering consultant, disputed an FBI analysis of shotgun pellets and fragments taken from the bodies of five Communist Workers Party demonstrators shot to death Nov. 3, 1979.

The nine defendants are charged with civil rights violations in the deaths.

FBI chemist Donald Havekost, in earlier prosecution testimony, matched fragments from bodies and pellets from shotgun shells by comparing their chemical composition.

But Manning said only one chemical element varied significantly in all of Havekost's samples and said an expert needs at least three elements to make meaningful comparisons.

U.S. District Judge Thomas Flannery had ruled Tuesday that the jury hearing the civil rights case would not hear a witness whose testimony helped the defense in a 1980 murder trial stemming from the shootings.

Rex Stephenson testified in 1980 that one of the five demonstrators killed at the rally had told him the Communist Workers Party needed a martyr and national media attention.

Jurors in the 1980 state trial later said Stephenson's testimony was one of several factors that led

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## Defense Rests In Federal Klan Trial

Continued From Page 1B

them to acquit six men of murder in the case.

Five of the 1980 defendants are among the nine men currently on trial, and their attorneys asked that Stephenson be allowed to testify again.

But Flannery said the testimony was "highly prejudicial" and "could have a meaning that the Communist Workers Party instigated the violence... because they wanted a martyr."

The judge also ruled that Greensboro City Manager Thomas Osborne would not testify.

The defense wanted Osborne to testify about the permit issued by the city for the communist-sponsored, anti-Klan parade, apparently hoping to convince the jury that the anti-Klan parade was not administered by the city.

If the parade was not administered by the city, the defendants would not be guilty under the federal statute.

## Rapid Fire Test (3/18/80)

The following tests were recorded on a Nagra 4.2, full track at 15ips in LN position onto 7" reel, 1.5 mil, Anger 632 tape. Used at 1/4" microphone on a Briel & Kjaer "Ingersoll Precision Sound Level Meter" Type 2209, with range set at 120 attenuation and 110 amplification, filter set "A" weighting, impulse set at "fast", set by SA [redacted]

Microphone set at 5' vertical height, pointed straight up, approximately 20' directly behind slotted. Tests 1-8 used a .38. S&W Model 10-4" barrel. Ammo → 158 standard load ammo of 158 grain "+P" load. Tests 9-16 same except 6" barrel used.

b6  
b7c

Test 1 - fired by [redacted] firearms technician, fired six shots as fast as possible, double action, point shoulder position, with standard load ammo.

Test 2 - fired by SA [redacted] firearms examiner, fired six shots as fast as possible, double action, point shoulder position, with standard load ammo.

Test 3 - same as test 1

Test 4 - same as test 2, except one misfire

Test 5 - same as test 2, except "+P" ammo used

Test 6 - same as test 1, except "+P" ammo used and off hand position

Test 7 - same as test 2, except "+P" ammo used, off hand position, and one misfire.

Test 8 - same as test 2, except "+P" ammo used and off hand position

Test 9 - fired by SA Unit Chief [redacted] firearms expert, fired six shots as fast as possible, double action, point shoulder position, with "+P" ammo.

b6  
b7c

Test 10 - same as test 9.

Rapid Fire Test - continued

Test 11 - same as test 7

Test 12 - same as test 1

Test 13 - same as test 1 except fired  firearms technician

Test 14 - same as test 13 except "FP" ammo used

Test 15 - same as test 9 except standard load ammo

Test 16 - same as test 15

Visicorder results: 25 cm/sec

Tests 2 - see attached

Results:

Fastest Time: Test 4, 3 slots in 0.486 second

Slowest Time: Test 13, 3 slots in 0.696 second

3 Gushots 16, 17 and 18 in 0.768 second

On 3/18/80, Greenboro PD advised that white female in yellow raincoat bought a model 10 S&W the day prior to incident, barrel length unknown.



- 2 -

00109030 E-Q2

## Quantis Test Slots:

For tests #7-12 the microphones and the firing positions same as test #1-6 except microphones turned  $90^\circ$  so that right channel mic toward ② and left channel mic toward ③.

Recorded on both channels of a Nagra IV-S set at 95dB, 1.5ips,  $\frac{1}{2}$  track stereo, 7" reels, 1.0 ml.  $80^\circ-90^\circ F$ , Wind calm to moderate

Test #1	-	weapon #1	fired in all firing positions
Test #2	-	weapon #2	" " " " "
Test #3	-	weapon #3	" " " " "
Test #4	-	weapon #4	" " " " "
Test #5	-	weapon #5	" " " " "
Test #6	-	weapon #6	" " " " "
Test #7	-	weapon #1	" " " " "
Test #8	-	weapon #2	" " " " "
Test #9	-	weapon #3	" " " " "
Test #10	-	weapon #4	" " " " "
Test #11	-	weapon #5	" " " " "
Test #12	-	weapon #6	" " " " "

All the test slots were then run at 500 cm/sec on the Honeywell 2112 dual channel recorder. Comparison will then made with unknown gunshots.

## Absolute Time Calculation (at microphones)

Using the time code information recorded on the channel 2 and channel 11 soundtracks, the time of the first peak (max amplitude point) is used as the time of the gunshot. This is an accurate measurement at the microphones, but it does not take into effect the differences in microphone to muzzle blast distances which result in a maximum of 0.171 seconds, or typically 0.090 second. Since channel 2 did not record the first gunshot, its ~~second~~ first recorded gunshot is set equal to the value of the second recorded gunshot on channel 11.

<u>GUNSHOT</u>	<u>Channel 11 Transient</u>	<u>Channel 11 Absolute Time (seconds)</u>	<u>Channel 2 Transient</u>	<u>Channel 2 Absolute Time (seconds)</u>	
1	2	0.000	Not recorded	—	
2	13	22.311	5	22.311	
3	15	26.436	7	26.428	-8
4	17	27.168	8	27.162	-6
5	18	31.569	11	31.561	-8
6	19	42.944	15	42.947	+3
7	20	43.478	16	43.482	+4
8	21	44.097	17	44.098	+1
9	22	44.152	18	44.154	+2
10	23	45.240	19	45.243	+3
11	25	49.554	20	49.558	+4
12	26	51.409	21	51.411	+2
13	27	51.681	22	51.684	+3
14	29	51.912	24	51.914	+2
15	30	52.263	25	52.266	+3
16	31	53.129	26	53.132	+3
17	32	53.478	27	53.482	+4
18	33	53.914	28	53.915	+1
19	34	54.124	29	54.124	—
20	35	55.392	30	55.395	+3
21	36	56.309	31	56.311	+2
22	37	59.314	32	59.318	+4
23	38	60.178	33	60.182	+4
24	39	60.426	34	60.428	+2
25	40	61.702	35	61.705	+3
26	41	62.056	36	62.061	+5
27	42	62.751	37	62.755	+4

Absolute Time Calculation (at microphones)

<u>GUNSHOT</u>	<u>Channel 11 Transient</u>	<u>Channel 11 Absolute Time (sec)</u>	<u>Channel 2 Transient</u>	<u>Channel 2 Absolute Time (seconds)</u>	
28	43	63.071	38	63.074	+3
29	44	63.361	39	63.362	+1
30	45	64.899	40	64.898	-1
31	46	65.644	41	65.648	+4
32	47	66.724	42	66.726	+2
33	48	67.758	43	67.762	+4
34	49	68.010	44	68.010	-
35	50	76.703	46	76.712	+9
36	51	83.275	47	83.276	+1
37	52	86.652	49	86.652	-
38	53	87.268	50	87.265	-3
39	54	88.342	51	88.346	+4

# Defense May Rest Soon in Klan Trial

Winston-Salem By Gary Terpening *Journal* 4-5-84  
Staff Reporter

Defense attorneys for nine Ku Klux Klansmen and Nazis may have finished their case in federal court here yesterday.

Although they told Judge Thomas A. Flannery that they have no more evidence to present, they have reserved the chance to call another witness who was delivered to the federal building by deputy U.S. marshals late yesterday afternoon.

When word came that the witness had arrived, the testimony of the government's first rebuttal witness was interrupted to let defense attorneys interview him. One attorney took a large chart with pictures of about a dozen demonstrators to the interview.

The attorney told Flannery that he was not sure what the man had to say about the case.

The witness's identity was not revealed in court, and defense attorneys declined to discuss who he is or what his testimony may be.

Yesterday also seemed to be a day of tying up loose ends in the trial of the nine men, who are charged with various civil rights violations related to violence at an anti-Klan rally in Greensboro on Nov. 3, 1979.

Urged by Flannery to wrap up their case, defense attorneys called a diverse group of witnesses — a metals expert to dispute FBI ammunition analysis, a Greensboro police officer who was at the autopsies of anti-Klan demonstrators killed at the rally, and a radar and walkie-talkie repairman.

Flannery also denied the request of defense attorneys to dismiss charges against two of the men on trial, Virgil L. See Defense, Page 16

## Defense May Rest Soon in Klan Trial

Continued From Page 13

Griffin and Edward W. Dawson.

Griffin, 40, of Stanley and Dawson, 64, of Greensboro, are charged with plotting to disrupt an investigation of the violence at the rally. Their attorneys argued two weeks ago that federal prosecutors did not show sufficient evidence to back up the charges.

But Flannery said that the evidence should be considered by the jury.

After the ruling, prosecutors began their rebuttal, which is expected to last at least another day. They recalled Bruce E. Koenig, an FBI sound technician whose testimony is the base for prosecutors' contentions about which of the men on trial fired shots.

Koenig previously testified that 39 shots were fired at the rally, and he said that with the help of videotapes he was able to determine where most of the shots were fired and who fired them. Prosecutors used his testimony and the admissions of several Klansmen before a grand jury to determine that Klansmen and Nazis fired the first 11 shots at the rally.

The men on trial say that communist demonstrators attacked them and that they fired in self-defense. Defense attorneys dispute the contention that communist demonstrators did not fire until the shot that Koenig has labeled No. 12.

Koenig's testimony was contradicted by a scientist that defense attorneys called to testify last week. The scientist, a professor at the University of Florida, said that as many as 42 shots were fired at the rally. He said that the fourth shot was actually two shots.



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# Klan-Nazi defense team rests case

4-5-84 Greensboro News &  
Record

By REBECCA RAGSDALE  
Staff Writer

WINSTON-SALEM — After 36 witnesses and two and a half weeks, defense attorneys rested their case Wednesday for Klansmen and Nazis charged with civil rights violations in the Nov. 3, 1979, shootings in Greensboro.

The defense themes — of patriotism and self-defense — were the same themes that proved successful in a 1980 murder trial when a state jury acquitted five of the nine men now on trial in federal court.

Defense attorneys also have called experts who contradicted expert prosecution testimony about the number and locations of shots fired on Nov. 3 and the elemental composition of shotgun pellets prosecutors claim link defendants and victims.

The trial began Jan. 9 and is expected to end this month. Prosecutors rested their case March 15 after testimony from nearly 80 witnesses spread over eight weeks.

Five communist demonstrators were killed and eight people wounded when a nine-vehicle caravan carried Klansmen and Nazis into the intersection of Everitt Street and Carver Drive, where anti-Klan protesters were gathering.

The defendants are charged with plotting to disrupt the Klan protest. In addition to the one conspiracy charge, several defendants are charged with killing or injuring individuals.

Also Wednesday, Judge Thomas A. Flannery ruled that the jury will decide whether Klan leader Virgil Griffin and former Greensboro police informant Edward Dawson attempted to block a police investigation into the shootings.

The charge is one of 14 listed in the indictment charging the nine men. Flannery ruled at the close of the government evidence that there was enough evidence on the first 13 counts for the jury to decide.

Viewing the evidence in the light most favorable to the government's

case, "virtually all the actions ... were aimed at stopping the flow of information to police," Flannery said in making his ruling.

Testimony indicated that Dawson, Griffin and others went several different places immediately after the shootings. Dawson returned home that afternoon, but Griffin and others fled first to Boone and then to Camden, S.C.

Several witnesses said that Griffin told them to remember their Klan oath, which includes a pledge of secrecy.

Dawson, Raeford Milano Caudle and Roland Wayne Wood did not testify. Griffin, David Wayne Matthews, Jerry Paul Smith, Coleman Blair Pridmore, Jack Wilson Fowler and Roy Clinton Toney each testified in his own behalf.

The government began its rebuttal late Wednesday by recalling its sound expert, FBI special agent Bruce Koenig.

Koenig said tests run on Nov. 3 gunshot recordings by the defense expert were somehow filtered, distorting the results.

Defense expert Harry Hollien, a professor at Florida State University, told the jury that it was impossible to geographically place the shots as Koenig had done and said that, contrary to Koenig's report, more than 39 shots were fired Nov. 3.

"I am not wrong in this case," Koenig told the jury Wednesday.

# FBI Bullets Expert: I Am Not Wrong

By CARL BRIGGS  
Sentinel Staff Reporter

An FBI agent who has testified that 39 gunshots were fired at an anti-Ku Klux Klan rally returned to the witness stand yesterday to defend his work and cast doubt on the reliability of an opposing study done by a defense witness.

Bruce E. Koenig, supervisor of the FBI's tape analysis bureau, testified that the defense witness evidently used a filter when analyzing tape recordings of gunshots, a method that would blank out high-frequency noises made by the shots.

Koenig said filters are commonly used for other acoustical studies, but not for studies of gunshots because the filters remove the sounds that need to be analyzed.

Koenig's testimony came late yesterday after the defense came close to resting its case in the federal court trial of nine Klansmen and Nazis charged with civil rights violations in connection with the fatal 1979 anti-Klan rally in Greensboro.

Five demonstrators were killed and others were injured at the rally, which was sponsored by the Communist Workers Party. The trial is nearly three months old.

Prosecutors called 77 witnesses and defense lawyers called 36, including several who had testified earlier for the prosecution.

Judge Thomas A. Flannery gave defense lawyers permission to call one other witness in the case, who might testify during a break in the prosecution's presentation of rebuttal evidence.

Koenig, the first rebuttal witness, looked and sounded confident on the stand, telling defense lawyer Harold F. Greenson on cross-examination, "I am not wrong in this case."

Koenig claims that he successfully pinpointed the muzzle blasts of 36 of the 39 gunshots he says were fired on Nov. 3, 1979.

Koenig studied television videotapes taken of the shooting and analyzed the gunshot sounds and echo patterns that were recorded on tape.

His study, a key piece of prosecution evidence, was challenged by the defense's expert witness, Harry Hollien, a University of Florida professor who was paid \$2,500 out of court funds for his work with the defense.

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Winston-Salem  
Sentinel

Thursday, April 5,  
1984

## Bullets Expert: I'm Not Wrong

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Hollien testified last week that no one could accurately place the locations of the muzzle blasts and determine who fired what weapon from the sounds recorded on tape, calling it an impossible task.

He also testified that up to 42 shots were fired, and said that one of the shots classified by the prosecution as the fourth shot was actually two shots.

After completing his testimony this morning, the prose-

cution called three more rebuttal witnesses, a doctor and two Greensboro police officers.

One of the officers, Grover Minor, took a statement the day after the shootings from defendant Coleman B. Pridmore, 40, of Lincoln, who was arrested near the scene of the shooting.

Pridmore testified earlier that he was forced to give Minor a statement of what happened at the rally before

being permitted to visit his mother who had come to the police station to see him. But this morning, Minor said he did not threaten Pridmore and never told him he could not visit his mother if he did not make a statement.

Pridmore's testimony was the second time a defendant charged that Greensboro police pressured Klansmen into making statements about the rally, and the second time the charges have been denied by police.







Evidence Receipt (to be used in lieu of correspondence covering evidence submissions to the Laboratory)  
7-16 (6-9-55)

FBI file # 44-81521

Agency submitting evidence Assistant Attorney General Civil Rights Division Department of Justice wash DC		Date 4/3/84 40404025
Delivered by N/A	Accepted by N/A	
Suspect GREENKIL	Victim Koenig	
Offense	Place and date of offense	

Brief Facts covering case

Prev. exams this case <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Evid. located Room # N/A	Report to be directed to Addressec & FBI, Charlotte
Copies to	Evidence to be returned to N/A	

Date of hearing, grand jury, trial, or reason why expeditious handling is necessary

In trial presently

Evidence

Examination of a copy of Q407 (Resubmission)

Signal Analysis Examination

Q407

INDEX FILE

1 cc and enclosures  
detached Div. 8

(This space for blocking)

(Use reverse side if necessary for additional evidence)

SEARCH SLIP

Violation(s): TAPE CR  
 Violation date:  
 Violation location:  
 Victim:

Lab No: 40404025 E  
 City: WASHINGTON, DC JCRD  
 Form: LF 04-03-84  
 Bufile No: 44-81521 -  
 Contributors No:

Subject:  
 GREENKIL,

Remarks:

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 Status 1 Status 2 Status 3 Category: 3  
 Trial Importance Doc\Sp Complex Volume Await Evid Buded: 05-16-84  
 Ack Type: 7- Principal Unit: SFO UC  
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Examiner(s)	Symbols	Evidence	Date Delv	Date Ret	Dict Date	Partial/Final Date(s)
[Redacted]	QZ	-----	-----	-----	-----	-----
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b6  
 b7c

Q Q407 K ----- Items ----- Evidence ret: -----  
 Resub? YES Request? NO Return No: -----  
 Call when ready? --- EXT -----  
 Latent? YES NO Q tabs? YES NO Print 3 Assignment Card(s)

Previous Submission(s):	ITEMS	QS	KS
31123021 E QZ CHARLOTTE	NC CE LF 11-22-83	1981	
30825057 E QE WASHINGTON	DC JAO LF 08-25-83	UNAVAILABLE - SEE PRIOR PE RESUB	
30621002 S RF CHARLOTTE	NC CE AT 06-15-83	UNAVAILABLE - SEE PRIOR PE RESUB	
30324062 E QE WASHINGTON	DC HQ LF 03-23-83	UNAVAILABLE - SEE PRIOR PE RESUB	
30117067 E QZ WASHINGTON	DC JCRD LT 09-30-82	1978-1980	
21217002 E QE WASHINGTON	DC HQ LF 12-17-82	1963-1977	
21117018 E QZ WASHINGTON	DC HQ LF 11-17-82	1962	

CONTINUED PAGE 2

Parcel Method and No: RF-ENGINEERING\EW-ENGINEERING  
 Received In ECC: 04-04-84  
 -----SFO, RM1B046  
 -----ECC, RM 3233  
 -----, RM-----  
 -----ECC, RM 3233

SEARCH SLIP (PAGE TWO)

Previous Submission(s):			ITEMS	QS	KS
21101016 E QZ				1959-1961	
WASHINGTON	DC	JCRD	LT 10-27-82		
21022074 E QZ			UNAVAILABLE - SEE PRIOR PE		
WASHINGTON	DC	JCVD	LT 09-30-82	REQ ONLY	
20719020 E QE				1958	
GREENSBORO	NC	PD	LT 07-16-82		
20528036 E QE				353-360	
CHARLOTTE	NC	CE	AT 05-28-82		
20528035 E QE				351-352	
CHARLOTTE	NC	CE	LF 05-28-82		
20513033 E QE				348-350	
WASHINGTON	DC	HQ	LF 05-12-82		
20511072 S QY				347	
CHARLOTTE	NC	CE	LF 05-10-82	RESUB	
20504049 S QY					49
CHARLOTTE	NC	CE	AT 04-30-82		
20503019 S QY RF				1957	47-48
CHARLOTTE	NC	CE	AT 04-30-82		
20422014 E QE				473-516	
WASHINGTON	DC	JUSA	LT 04-13-82	REQ ONLY	
20422013 E QE				457-472	
WASHINGTON	DC	JUSA	LT 04-14-82	REQ ONLY	



Tape #14 - Direct Examination of Bruce E. Koenig (Beginning)

Q Would you please state your name, sir, for the record?

A My name is Bruce E. Koenig, that's K-O-E-N-I-G.

Q What is your present occupation, Mr. Koenig?

A I'm Special Agent Supervisor with the Federal Bureau of Investigation in Washington, D. C.

Q And how long have you been a Special Agent for the FBI?

A I came on board in 1970.

Q And where are you currently assigned, Mr. Koenig?

A I'm assigned to (Pep Teppy?) at Headquarters, Mr. Larson.

Q What is the nature of your work at FBI Headquarters?

A I work in the technical services and laboratory divisions in the field of magnetic tape analysis.

Q And what do you mean when you use the term "magnetic tape", Mr. Koenig--what does that encompass?

A Any type of magnetic recording--cassettes, 8-tracks, reel-to-reels, even phonograph records, micro-cassettes--anything that has a magnetic recording device. I've also included things like most general sound tracks and video tapes, general magnetic patterns also.

Q What are your responsibilities in the field of magnetic tape analysis?

A The majority of my work is the perimeting field--tape enhancement, signal analysis, tape authenticity, voice comparisons. But I'm also responsible for buying tape recorders, tape and laboratory equipment for the FBI worldwide.

Q And when you use the term signal analysis, Mr. Koenig, what do you mean by the term "signal analysis"?

A This is analyzing signals that are non-voice in nature, ah, we often analyze telephone sounds to determine what number who called, gunshot sounds, radio frequency-type sounds to determine exactly what they are. I did most of the work with the air (???) crash involving what was the speed of the engines at the time of the crash. And we did that by analyzing the various sounds that a (???) engine makes at certain thrust levels.

Q And for what agencies have you conducted forensic tape examinations?

A I've conducted numerous exams for federal, state and local authorities in all 50 states, District of Columbia, Puerto Rico, Guam, Virgin Islands and for 12 foreign countries.

Q And in how many different investigative matters have you personally conducted taped examinations?

A I believe I'm up to almost 1,800 now.

Q And in the process of those examinations, Mr. Koenig, what would be the total number of separate tape recordings involved?

A Something over 5,000.

Q And of that number, Mr. Koenig, of 5,000, approximately how many of your examinations involved video tapes as opposed to audio tapes?

A In the last few years--last five or six years--we've gotten much more into video tapes. I would say that my present workload is maybe twenty percent video tapes.

Q Mr. Koenig, do you devote the majority of your time to magnetic tape analysis?

A Yes, sir, I do.

Q And how long have you been involved in this type of work?

A I've been involved fulltime since 1974--about ten years.

Q Have you had occasion to publish articles in your field of experience?

A Yes, sir, I've published a number of articles.

Q Have you instructed other persons in the field of magnetic tape analysis?

A On a continuing basis, I train people within our agency and also present papers and lectures to various legal and law enforcement agencies.

Q Would you please tell us your formal educational background, Mr. Koenig?

A Yes, sir. I have a Doctor of Science degree from the University of Maryland. I have a double major in Physics and Mathematics. I've completed an Electronics course through DeVrei Institute of Technology and I have my Master's Degree in Forensic Science.

Q Where did you obtain your Master's at?

A I obtained it at George Washington University in Washington, D. C.

Q Have you been accepted as a member of any professional societies?

A Yes, sir. I'm a member of the (L. U.?) Engineering Society, The American Institute for Physics and the Acoustical Society of America.

Q In addition to the training you mentioned just a moment ago,

have you received any other more specialized training in the field of magnetic tape analysis?

A Yes, sir. I've attended numerous seminars and schools in my field and I'm a Senior Examiner in the FBI laboratory (???) in this field. I've attended courses in spectrographic analysis (inaudible) digital signal processing equipment at (???) Corporation, San Diego, and I've received quite extensive training from Dr. Stockman and staff, University of Utah and his company of Soundstreak which is a digital production type of company in Salt Lake City, Utah.

Q Have you ever testified previously as an expert in the field of magnetic tape analysis?

A Yes, sir.

Q On how many occasions would that have been, Mr. Koenig?

A Approximately 125.

Q On those occasions have you testified for the prosecution and the defense?

A Yes, sir, I--once we do our examination we will provide testimony free of charge for either the prosecution, defense, or as a-- for the judge, himself, as a (???)

Q Have you previously conducted examinations in criminal investigations involving gunshots that had been recorded on magnetic tape and how many times have you examined magnetic tape that had gunshots on it?

A I have conducted, probably, thirty or forty exams; ah, there probably would be approximately 100 recordings.

Q And do you also routinely review the work done by others in the FBI laboratory involving gunshots that have been recorded on magnetic tape?

A Yes, sir. We have an audio process that boosts examination to the--anything but a fairly routine nature, that's been done before, ah, reviewed by all the examiners, whenever we examine guns. For instance a lot of our work in gunshots is also, like, evaluating silencers. It's against the law to have a silencer, but you've got to prove that in fact it is a silencer. And we conduct numerous examinations in that field and I review much of the tests reported to make--determine what the silencers are doing specifically and what gunshots--gunshots really look like under a (???) conditions.

Q In the course of your work, Mr. Koenig, and this is an "if you can" kind of question, can you estimate approximately how many different gunshot signals you've examined on recorded magnetic tape?

A Ah, it would be a very large number--certainly in thousands, because you have to run so many test shots to determine--before you start getting into gunshot analysis--we spend almost a year off and on just recording gunshots and various other types of signals that may be confused as gunshots, and this is an ongoing process for us, so it's certainly in the thousands.

Q Now, you testified previously that you have been qualified in other courts as an expert in the field of magnetic tape analysis, have you also been qualified as an expert in--concerning the analysis of gunshots that have been recorded on magnetic tape?

A Yes, sir. On three or four occasions we--I testified in the field. A number of the other examiners have also testified. It's a field that we often get what you call a stipulation, in other words, record (???) take our evidence without us testifying. That occurred in the case involving John Hinkley when he attempted to assassinate President Reagan; we did all the gunshot analysis work, that was stipulated to and we did not have to testify.

Q Have you ever written or lectured concerning the field of forensic gunshot analysis?

A Yes, sir, I published a number of papers including the FBI's technical position paper--or most of that paper--concerning the Kennedy assassination. I also assisted the National Academy of Sciences in parts of their report concerning the Kennedy assassination. I have written a number of papers, and presented lectures, concerning gunshot analysis for the legal and scientific community.

Q Now you mentioned the Kennedy assassination examination, Mr. Koenig, would you briefly describe what work you did so the court and the jury may understand what you're referring to?

A Well-- as you might imagine if you watched the news during that attempted assassination, there was a tremendous amount of confusion and the Secret Service and our investigative agency in the field in Washington wanted to immediately know how many gunshots were fired, if there was an accomplice involved, if--if what we saw on film had happened and the person they grabbed was the right person. So we had to do a very--examine it almost immediately to determine how many

gunshots were fired--which we were able to determine--we also determined that there was no other gunshots fired other than from John Hinkley's gun and we provided assistance in locating where people were located at the scene, in the sense of where John Hinkley was and where he was shooting...

Judge: You talked about the Kennedy assassination, have you?

Q Yes. Mr. Koenig. I have inquired as to the Kennedy assassination...

A Oh, I'm sorry. I apologize. The Kennedy assassination, which occurred when I was a senior in high school, in 1963, involved the assassination of President Kennedy. And several years ago, a Congressional Committee was looking into the assassination of both President Kennedy and Dr. Martin Luther King. Part of the results were that there was a second shooter involved in the President Kennedy assassination. Now this was based on acoustical information which said that there was evidence of gunfire on his recording, on the police radio--what happened was the police riding on their motorcycles at the scene and one of the radios got stuck on--button stuck--you could hear what was going on. Well, we reviewed the material and found that there was no evidence for their finding. The tape did not reflect something that we would perceive as a gunshot. So we then--also had the National Academy of Sciences--we were involved with them--and they agreed with this finding. And they found that the recording itself (inaudible) when the President got killed, and second, that even if it was, the recording they were looking at occurred about one minute

after the President was actually shot and he was on the way to the hospital at that time. But the Congressional Committee experts came up and said, "well, there is a 95 percent chance or better that there is a second gunshot" and here the recording didn't even occur at the time of the assassination. So I was very involved with that case, getting it straightened out, make sure what really happened.

Q Could you briefly describe, Mr. Koenig, the types of equipment that you utilize in the area of magnetic tape analysis?

A The equipment is mostly very electronic in nature. You have a number of places to scan or you--what we call frequency (inaudible) you can actually see the various components of the voice when someone talks, or components of non-voice signals, like telephone signals--can see a very graphic--you also can look at what is called the (???) display you can use in things like gunshots, you can actually look at the wave length itself, which is the same kind of thing you see on one of these opera shows, that show you got his heart beating on a monitor. That's a kind of display unit. We can actually put that also on paper. (???) that information in very high resolution. We also use a lot of (???) filters. A lot of our work involves moving (???) information. A undercover agent and a defendant meet in a bar to discuss an accomplice and they're playing the jukebox very loud. We have to try to remove as much as possible of the music, it's interfering with the conversation, make it more understandable. We have a large number of Wilson digital type filters--computer filters--and we have lots of professional tape recorders, as you might imagine, and all kinds of auxiliary equipment.



We have our own full-scale computer system, that will allow us to digitize anything to very high resolution and all peripherals to that. Some of the analysis will probably be moving in the next few months before we run out of space. The FBI Headquarters are full (inaudible) and we'll be needing even larger facilities to allow us to do even more (inaudible).

Q Mr. Koenig, in addition to the other cases which you already discussed, can you describe any other cases in which you have done work that may be known to the jury?

A I work on most major airline crashes. The closest one to here, I worked on the 1974 Eastern Airlines crash in Charlotte. I testified in that case. I worked on the ABSCAM case involving political corruption of U. S. Congressmen and others. I worked on what is called the Woodman case, it involved the assassination of a Federal judge in Texas. I worked on a considerable number of foreign espionage cases involving a Russian cold spy.

Q And did your work in each of those cases, sir, involve an examination and analysis of some type of magnetic tape?

A Yes, sir. All my work involves magnetic tape.

Q Your honor, at this time the United States submits Mr. Koenig as an expert in the field of magnetic tape analysis.

Judge: Alright.

Defense: (inaudible) lodge an objection for the record.

Judge: The court will accept him in that capacity, as an expert, qualified to give an opinion. Now I might say this to the jury at this

time. As to expert testimony. The rules of evidence ordinarily do not permit witnesses to testify as to opinions or conclusions. An exception to this rule exists as to those whom we call expert witnesses, such as this gentleman. An expert witness in a particular field is permitted to give his opinion in evidence. Witnesses who, by education and experience have been expert in some art, science, professional calling, may state an opinion as to relevant and material matter in which they profess to be expert. And they also may state their reasons for their opinions. You are not bound by the opinion of an expert. If you should decide that the opinion of an expert witness is not based upon sufficient education and experience or if you should conclude that the reasons given in support of the opinion are not sound or that the opinion is outweighed by other evidence, you may disregard the opinion in whole or in part; in other words, you should consider the expert's testimony in connection with the other evidence in the case and give it such weight as, in your judgment, it is fairly entitled to receive. Alright.

Q Mr. Koenig, let's--let's begin with some basic propositions. Would you tell the jury just what a sound wave is?

A Yes, sir. Anything makes a noise. A tree falls down, or you talk, you vibrate the air causing particular types of waves. And these waves then go through the air and vibrate your--components of your inner ear--and allow you to hear that. The waves are very unique in the sense that we can--you can hear me talking and hear my sound waves, and hopefully understand exactly what I'm saying. Other types of sounds aren't as easy to decipher. For instance if I go (noise), well, if I

asked you how long did that last--that I hit that--that the sound lasted--it would be very difficult for you to do that. Whereas instruments--you have these sound waves that--just simply vibrations in the air--that are audible to you, usually in a range that we call about 20 perts or cycles per second to about 20,000. Some people can hear a little bit better and all of us, as we get a little bit older start losing, usually our high frequency, hearing ranges.

Q Alright now. How fast does a sound wave move, or travel?

A Sound waves are very different than light. Light waves travel close to instantaneously. Especially over short distances. Sound waves (inaudible) sound waves vary in speed by elevation and temperature. I'm quite sure in the upper atmosphere the main consideration is temperature. For instance, up around 55 degrees, the speed of sound would be about 1100 feet per second. And we've all experienced differences. If you see lightening way off in the distance and about five seconds later you hear the thunder, it is traveling at 1100 feet per second and that's about 5500 feet or a little bit over a mile. So you could say the lightening is approximately one mile away, because the sound waves are much slower than the light waves. So, I'd say sound travels approximately a mile every five seconds. So you can always determine how far away lightening is. If you see a hunter in the woods way off in the distance--you see him shoot a gun--you see the smoke often comes out of the gun before you hear the gun shot. Or somebody chopping wood--you'll see the person chop the wood and his axe is coming back up and then you hear the sound, because the sound takes longer to

get there than you could see him doing it. The sound wave is a very finite move--what we call finite--speed. At a certain temperature, you have a certain speed of sound.

Q Now, Mr. Koenig, does the loudness of it--any particular sound--have any effect on how fast that sound wave travels?

A No sir. I can talk very softly or I can yell at the top of my lungs, the speed of sound is always the same.

Q And what happens to one of these sound waves when it bumps into some stationary object?

A Well, as we all know, a sound wave doesn't have a lot of power, in the sense that we're going to knock the wall down if we yell at it. What happens is you get a certain amount of absorption, ah, but usually not that much; usually it bounces off the wall in a very particular way, something like a pool shot or playing billiards, and you hit the ball it goes off at a certain angle. It's the same way with sound, it hits at a certain angle and it's always going to go off at the same angle. A certain amount of it is absorbed, but not a whole lot. On a flat wall, you won't get much absorption. If I go in this courtroom and it doesn't have a lot of flat walls, it's broke up--if I go (noise) we all can hear after I clap, the sound after I clap. It's bouncing off the walls and coming back to you. We call that room reverberation. So, we make a loud sound it bounces all over the walls until it finally dies out and then you can't hear it anymore.

Q Mr. Koenig, would you describe (inaudible) just what magnetic tape is?

A Well, I've always heard the old analogy that it's cellophane, glue and rust. Which really isn't--it's fairly accurate. The backing of the tape is just plastic, usually polyester; some of the old tapes are acetate, but usually basically a polyester. Onto that is glued iron oxide, which as maybe you all had in chemistry, is basically rust, and it's held onto the tape with--they call a binder--but it's a type of glue that actually coats the tape with this magnetic iron oxide or --there's all kinds--if you're into tape recording--there's ferric oxide and metallic and--all of them are with basic polyester backing with binder glue and with a (???) coating on top of it.

Q And what then is a magnetic recording on one of these tapes? What happens to this magnetic tape?

A Okey. You record something on a tape, you're really not adding anything to the tape at all, that's why you can erase it, you don't take anything away when you erase it. All your doing is taking this iron oxide as a bunch of little magnetic fields. It's often like--if you've ever seen in high school or something--where you put a magnet, you put a bunch of iron filings, and it makes all this--funny pattern, or you just pick a magnet and it picks up a whole bunch of iron filings, spreads them all over the place. Well, that's a certain magnetic field. So when you put a recording on a tape, all you do is line up these fields. When you erase the tape, all you do is put them in a random fashion, in other words, they're going all different directions. You want to record over again, record a magnetic field onto it, you line up all the (???) again and if you look at them--you can actually look at these--the matings

we call them--lined up on the tape, you can actually see them. They're all just vertical lines going right down the tape. And when you erase them, they just disappear, you don't see them. Nothing's been removed, or taken from the tape, it's just the lining up of these little magnets. (inaudible) little tiny magnets lining up on the tape.

Q Now, can you describe, briefly, how it is that a sound wave comes to get imprinted on magnetic tape?

A Normally it's--you have a microphone, and there's various types of microphones, but basically a simpler type is a diaphragm, which vibrates--something like your telephone. When you talk on your telephone it's got a microphone, so the person can hear at the other end. It vibrates and sends out a signal--an electrical signal--low, not very high voltage that is then boosted by a tape recorder or video recorder and put through into a--what we call--magnetic head. And a magnetic head is like--it's a magnet. It's a magnet you can control, it's an electromagnet. So if you put a certain type of electricity, or this current, from the microphone in there, it puts a certain pattern on the tape--all it's doing is lining up these other magnets. So you've got this one magnet--this electromagnet--lining up these--all these other little magnets on the tape. And then, when you want to play it back, all you do is take another magnet--one this--one magnetic field across it. Have any of you taken these little magnets you hold things up on your refrigerator, you put them together a certain way, they won't even go together; other times they really stick together very well. Well, it's the same thing. It just sees that magnetic field going down towards

this other electromagnet, puts out this little low--low curves, little small amounts of electricity which is boosted, amplified, again. And wired so you can hear--either speaker or headphones or something.

Q Now, Mr. Koenig, once a sound wave has been imprinted on magnetic tape in the process you were just describing, can--can you visually see this recorded sound on the magnetic tape?

A Yes, sir. You can put a solution--very weak solution--which has some of these magnetic filings we were talking about, under a paper in there--you can put it on there you can actually see all of them lined up. Usually, if you--patterns are real--you know, the tapes only about a quarter of an inch wide, it's narrow, so the pattern on the tape is even smaller than that, usually. So it's very small so you will have to look at it under a low power microscope. Anybody can look at it, it's very obvious (inaudible). Now you couldn't look at a pattern and say, that's, you know, Aunt Nellie saying let's go to the movies. But you can say that there's a pattern on the tape, there is a recording.

Q Now, could you describe in some greater detail the equipment that you and your laboratory use when you conduct an analysis of a magnetic tape?

A Well, as I said, we talked about, these graphic displays (inaudible). What we do is, part of this equipment is geared very sensitive to certain types of sounds. And I talked about voice out of the music, not so much on things like--something where I banged something--this instrument can give you better readout on stuff like that. What we use it is information can be graphically displayed on a readout. And

by listening and through the experience--a rookie in our field has like two years full time experience doing nothing but this. It just requires a lot of time and experience (inaudible) tapes just all day. And you use the equipment in the lab and this very sophisticated technical gear and you continue to pay lots of money for its upgrading, and by listening and your experience you make very, very accurate decisions about them. And then we come back and listen to a part-- like for instance, if I'm filtering tape, I want to make it one (???). Whenever I run into a filter that has music in the background, and the filter takes all of the music out, you say, boy, I did a wonderful job. However, if the voices are understandable (?) I did a lousy job. (unintelligible) So one filter, you say, well, technically he did the job perfectly, but in doing so he (unintelligible). Therefore, I wouldn't do that. I'd rather leave some of the music in and use a non-filter and take half the music out, that allows me to hear. So we're always aiming for (inaudible) enhancement--which we call this type thing--to make it more understandable. You can't just technically run it through a machine and say "Hup, I've got it". And the other problem is that, you know, some people come in our lab and kind of talk Star Wars or something and here's all these instruments and lights blinking and too many knobs on them. Well, if it goes through and takes the music out and it hurts the voice, we might be able to adjust the filters to do a better job. So, you've always got to be thinking and you always got to be listening to what you're doing. To interpret what the equipment's doing. And to look at these displays and say, "that's



what I'm looking at", you know a display's no good if someone walks up and hands me this (inaudible) we talked about, like, he could be somebody's partner. You know,--if I didn't--you know--have any idea, if I just says "what is this"--(inaudible) maybe be a liar. But if I listen to it, it might become very obvious what it is.

Q Now, we've spoken quite a bit, Mr. Koenig, about magnetic tapes but, again very briefly, could you describe what a video tape looks like as opposed to just regular audio tape that might be in a tape recorder. What different types of things are on a video tape?

A A video tape will display two different things, audio information which is pretty well done the same as a regular tape recorder and you've got visual information which is put on by a very sophisticated (head design?) which runs at very high speeds, but basically it's the same--it's putting a magnetic pattern on that tape to be read by a (???) tape recorder. And if any of you all bought video machines, you know, you always get these things--the more expensive have many heads, the cheaper ones have four heads--well all of those heads do different functions. And that's what's happening--you're just reading the same thing, it's just put on a different way and it can be read back through the equipment to produce the visual. But the sound track will look basically the same as it would on a regular tape recorder.

Q Is the video track that is on the video tape separate and apart from the audio track that is on that tape?

A It normally is, but the--what happens is the manufacturers are trying to get better and better audio are doing all kinds of little

tricks of mixing two together. But that's more what's coming out-- the state of the art now. And it's not basically used by most of the recorders.

Q When you have occasion, Mr Koenig, to conduct an analysis of a video tape, do you examine both the audio and video portion of that tape?

A Ah, it kind of depends. Oftentimes, for instance in the ABSCAM case, the video was fine. The audio was sometimes hard to understand, because the microphone was maybe ten feet away from where the people were talking and we were picking up other noises. So sometimes we just copy the video information directly from the original to our copy, and then process--or analyze--just the sound track. So it really depends on what we're looking for in the tape.

Q Do you, however, view the video portion of the video tape in conducting such an analysis?

A Yes, sir.

Q Now, Mr. Koenig, were you requested to examine certain video tapes that were made in connection with an incident that occurred in Greensboro in November, 1979?

A Yes, sir.

Q And can you tell us a little bit about how you first became involved in analyzing those video tapes?

A Well, I think I was having a nice day and--I don't remember what day of the week it was--and all of a sudden all these people trooped in and said "we have all these video tapes, can you tell us

how many gunshots were fired, who they were firing at, you know, everything--everything you can tell us about what happened at the scene". And, I think they expected that I would tell them in about five minutes whether we could do such an examination or not, and we-- at the time--said well, we can look at them, but we'll need the original recordings for, ah--at a later date--providing us, before we can really get started on our examination just to see what could be--you never know when you get these things if--let's say you have a bad microphone; well, even though we can do such an analysis, if the recording is (screwed up?) quality, we can't do something like that. Does that answer your question.

Q I believe so. Now, subsequent to this first conversation you--you just described, when was it that you first came into possession of the original video tapes in connection with this case?

A I received the original tapes in, ah, January of 1980.

Q And on, ah, on those occasions in January, 1980, did you have an opportunity to speak with the cameraman who had actually shot (inaudible)...you were asked to examine?

A Yes, sir, I did.

Q And what information did you want to obtain from them, Mr. Koenig?

A Oh, basically, the best they could tell me, where they were at the scene, what their equipment was like--the type of equipment--what kind of microphone were they using, how were they using them--was the microphone attached to the camera, or was it separate?--ah, any

information of that type that involved the sound recording basically.

Q Did you, during the course of those discussions with the cameramen, obtain the model number and the specifications of the cameras and microphones that were used on November 3?

A Yes, sir.

Q May I approach the witness, your honor?

Judge: Alright.

Q Mr. Koenig, I'm going to place before you two items that have already been introduced into evidence. Government's Exhibit VT1b and VT2b. I ask you to take a look at those two pieces of evidence, Mr. Koenig, and tell us if you can identify them?

A Yes, sir.

Q What are they, sir? First VT1b.

A That is the--a copy of Channel 11 video tape with the time code added.

Q Have you ever seen that copy before, sir?

A Yes, sir. This copy was given to me in August, 1980, by Special Agent Castaneda.

Q And, ah, what did you do with that video tape once you received it?

A I used it to finish up my analysis in the matter. And then, subsequently to that, I turned it over to State Court.

Q Would that have been in Guilford County--in Greensboro, sir?

A Yes.

Q Alright. And VT2b?

A Yes, I received that from Special Agent Castaneda in January of 1980. I also turned that over to the court in Guilford County.

Q Ah, was it in Greensboro, is that right?

A Yes.

Q What is VT2b, I don't know that you...

A I'm sorry. It's a Channel 2 video tape.

Q Now are these video tapes that you worked with during the course of your analysis in this case?

A It's two of the video tapes that we used, yes sir.

Q And do they have a time code and Channel character imprinted on them?

A Yes, sir.

Q Now, when you first met with the cameramen from Channels 2 and 11 in January of 1980, did you--were you present when they carried their original tapes up to Washington?

A Actually, I believe they were all taken to Quantico, Virginia, that is our training facility in south (inaudible).

Q And did you have occasion to copy any information directly from those original video tapes?

A Yes, sir. I made very high quality audio copies from just the audio copy of the video itself, I was interested in a prominent (???) of the time. So I copied that and put some other information on tape so I could hear it (???) check things out (inaudible).

Q Alright. Now, would this have been both the--you copied both the original--the audio track of the original tapes of Channel 11 and

Channel 2, is that correct?

A Yes, sir, that's correct.

Q Now, in the process of making that copy, just the audio track from those video tapes, did you have occasion to observe the video tapes as they were being played and to observe the monitoring equipment utilized in making the copies?

A Yes, sir, I did.

Q And tell us what opinion you might have as to what the quality of those original tapes was, sir?

A The quality was excellent, these--two different tapes.

Q Well, now, your referring to the copies before you, but I'm talking now as to the original video tapes that were brought up by the cameramen.

A They were, ah, actually much better quality than I had hoped for. Actually, very excellent quality recordings.

Q And, will you describe for the court and the jury, Mr. Koenig, the process whereby you made your audio copy from this--these original video tapes. Tell us, please, what equipment you used and what you did to obtain those audio copies?

A Okey. The tapes were actually played back by Special Agent Castaneda (inaudible) (Quantum?)..they use a professional quality video tape recorder. And I took the--they have two outputs off the--(???) one is the video information, visual information, one is the audio information. So I took a direct line out of that tape recorder directly into my recorder, which was a--one of the finest quality professional recorders made, and I recorded at very high speed

(inaudible) and put a high quality time code on the second channel of the tape allowing a very accurate timing sequence off the tape. So, in other words, I made the highest quality audio tapes that you-- virtually could make and made sure I lose nothing off them.

Q And did you copy the audio track off the entire video tape?

A Yes, sir.

Q You didn't stop at any one point and cut anything off, you copied all of the audio information on those original video tapes?

A Yes, sir.

Q May I approach the, ...

Judge: Yes.

Q Mr. Koenig, I'm going to place before you two additional exhibits that have also been admitted into evidence, VT1a1 and VT2a. I'm going to ask you to examine those exhibits, sir.

A I presume these are the original tapes. Since I didn't take custody of them, I didn't personally mark them.

Q Okey. Are the markings on those two tapes consistent with what you recall as the original tape?

A Yes, sir.

Q What is the brand of that, ah, of the video tapes contained in those two?

Defense: Well, I object to him reading something off the box unless he knows, your honor.

Judge: Well, it's in evidence, isn't it?

Prosecutor: Yes, your honor.

(inaudible discussion)

Prosecutor: I believe may have been mistaken. I do not believe  
lal is--is in evidence, your honor.

A One of them is Scotch, the other one--they've got a sticker  
over it--without pulling the tape off, I couldn't be sure.

Q Thanks. Do you have an opinion as to the quality of Scotch  
Brand video tape?

A High quality, standard brand.

- end of tape #14 -



Tape #15 - Direct Examination of Bruce Koenig (cont'd from Tape #14)

Q ...you know, sir. Why did you not feel the Channel 12 tape contained any significant information based upon your viewing of that video tape?

A We reviewed it, and we didn't see any information that, at least, we deemed appropriate, it was--we didn't see anything about the shooting or anything on that particular tape.

Q Okey. Now, did you view any other video tapes, or copies of any other video tapes, other than Channel 12 and Channel 11 and Channel 2?

A I didn't have original video tapes, we had visual video tapes on slow motion, things like that.

Q Did you have occasion to view any 16 millimeter film or copies of 16 millimeter film?

A Yes, sir. I made a high quality copy from Channel 11, which was a film on video tape.

Q Channel--was it Channel 8, that was on...

Objection, your honor.

Judge: Well, I'll permit it.

Q And did you reach a conclusion as to the potential value of conducting extensive examination of the Channel 8 tape or film?

A Yes, sir. We analyzed the sound track--the sound track was sort of distorted, it just wasn't very usable to us. We used some of the visual information on Channel 8 (???) but not very much.

Q What did you conclude as to the reason why the audio information on Channel 8 film was so distorted?

A I would presume it's probably the microphone, ah, they told

me the equipment's fairly old, and I would think--we worry so much about why, just the end result is the quality is so poor it's unuseable.

Q So, in addition to the audio tapes we've discussed and the video tapes that you've identified, did you request or gain access to any additional charts or graphs or any additional information in the process of conducting your examination?

A Yes, sir. We, ah, immediately received blowups of (one inch to five-fourth range?) of the general area of the shooting. We also had to have photogrammetric work done in our laboratory by Special Agent Richards to put the cars in location exactly on the, ah, on the chart.

Q Why did you need that information, Mr. Koenig?

A Much of our work we're doing on this--peeling of the echos off various things--buildings and cars and anything else--so we needed to know where the cars were so that we could verify where the echos would be coming off them.

Q Now, you mentioned a one to five scale, ah, was it a map or a drawing of the area?

A I don't know the distinction. I--I was called...

Q Why did you need that--that drawing of the intersection?

A We needed it, again, a very accurate drawing of where the buildings were exactly to determine echos and where they bumped into everything else. We couldn't even do the examinations until we received that.

Q Now, would you tell us again, what--what you were initially asked to do, ah, in conducting your examination?

A The best word used was "everything"--anything you can tell us about the shooting (unintelligible) you can tell us how many gunshots were fired, who fired them, who were they firing at, what kind of gun they used, anything you can tell us. That was the request of the investigators.

Q Now, prior to conducting your examination, or during the course of your examination--at any time, did you speak to or rely upon statements from people who had been at the scene?

A No, sir. We--I mean--the investigator came in--you know, they came in and said some people said a couple hundred shots were fired and other people said only a couple of shots were fired--that just wasn't important to our investigation. Everything depended upon the data, so therefore we independently determined how many gunshots were fired and anything else we could have gotten--the situation (inaudible).

Q Now you mentioned investigators, but did you go down and attempt to interview any of the people who, ah, were--were in the parade and rallied or any of the other persons who were present at the scene?

A No, sir, I really didn't even know that much about the case other than my small part.

Q Were you told what groups were involved in this incident or the identity of certain persons as belonging to one group or another?

A I was advised of the groups involved, not who was in what group.

Q So, when you viewed a video tape during the course of your analysis, had you been given any information that would tell you, when you saw a person on that video tape, whether he was a member of the parade, or whether he was a member of some other group?

Objection to the leading, your honor.

Judge: Oh, I'll permit it, go ahead.

A No, sir, I--I mean investigators came up, talked a lot, but, you know, since it was months after we got--they talked to us and we got the information (inaudible) I viewed it, I saw a number of people I'd never seen, I don't know their affiliations, I--maybe they have no affiliations. We just viewed it as trying to determine all we could about the gunshot analysis, like (inaudible) firing, (inaudible) who--you know, how many gunshots were fired, who in particular was firing, and any other information (inaudible).

Q As you sit here on the stand today, Mr. Koenig, are you familiar with the names of the people you see in those video tapes or the groups with which they were related?

A Yeah, I can name the groups but I can't--which people were (inaudible)--an individual and say that person's in some particular group, and the names--I know I heard people say them, but I--it really never sunk into me, I can't name the--many people involved in this at all.

Q Alright. Mr. Koenig, have you ever interviewed any of the defendants that are present in this courtroom?

A No, sir.

Q Now, you testified, Mr. Koenig, as to your opinion concerning the quality of the original video tapes brought to you by the cameramen and you described how you made an audio track from those original films, getting back to that procedure for just one minute, do you have an opinion as to the quality of the audio recording that you took from those original video tapes?

A Well, of course when you make a recording...

Objection, your honor (inaudible)

Judge: I think it's a perfect question.

Defense: I object simply because he's already asked it...answered the question.

Judge: Well, he may answer, go ahead.

A Well, fortunately, when you make an audio recording--you can't do this with video--you can listen to the signal coming into the tape recorder and you can listen to the signal that's recorded on the tape, and it's just a switch you can flip back and forth. So I was able to listen to the signal coming off the video tape and just flip the switch and I could hear what was actually on the tape I recorded. That way I could verify that what I was recording was the same information that was coming into the tapes. So the quality was excellent.

Q Now, Mr. Koenig, based upon your experience in analyzing gunshot sounds on other magnetic tapes in other cases, different from this, what is the largest single problem that you encounter in conducting such analysis?

A The quality's too poor, just can't make an analysis. For instance, a gunshot is recorded over a telephone line, or what's often happening in police matters it's over a transmitter--a person has a little transmitter on, it's like a radio--it goes out to a place another police officer's recording it. Well, once it goes through that system, the information is so distorted it's not reuseable. Well you can say "a loud sound occurred", but you can't sit there and say "that was a gunshot".

Q And, Mr. Koenig, do you have an opinion of the relative quality of the magnetic tapes that you had to work with in this case as compared to the quality of those other magnetic tapes that you've examined in those other cases?

A Well, in most cases, this quality is a lot higher. Certainly, in some cases, like the Reagan--attempted assassination of President Reagan--we also had excellent quality. But we often do not have such quality, so it limits what our examination can do. So one of the first things we want to look at is the quality of the film. If it wasn't, we wouldn't have made any examination.

Q And what significance did this have for your examination in this case?

A The quality, you mean?

Q Yes.

A It allowed us to then proceed forward and do many of the exams that are possible--and that have been done in such cases where you do have high quality--for us to make a lot of determinations as to how many gunshots were fired and what's a gunshot and what is not a gunshot. So

we were very fortunate to have such quality.

Q Now, Mr. Koenig, you said that when you spoke with the cameramen who had been present on the scene, you obtained information as to the type of recorders they were using and the type of microphones that they were using at Everitt and Carver. Do you have an opinion sir--let's first talk about the Channel 11 equipment that, ah, was used by Mr. Boyd.

A It's a high-quality, standard Sony video recorder.

Q Is it a broadcast quality recorder, sir?

A Yes, sir.

Q And what about the microphone, sir?

A Ah, the microphone came with that camera, so it would be of the same quality as the camera.

Q Now, did, ah--when you spoke with Mr. Boyd, did he tell you, sir, whether or not his microphone was connected to a cable--whether he had an additional microphone connected to a cable on that thing?

Objection. Your honor, the witness is not here to testify, I don't believe, ...

Judge: Boyd's available.

Defense: ...Mr. Boyd, he just said in general that he talked to cameramen, so...

Judge: Boyd--Boyd's available, so this wouldn't be, strictly speaking, hearsay. Is that your objection? Is your objection to hearsay objection?

Defense: Well, my objection is really that he hasn't testified that he spoke to Mr. Boyd, he said he spoke to cameramen about...

Judge: Well, then, you can rephrase the question. Ask him if he talked to Mr. Boyd.

Q Mr. Koenig, when you spoke with the cameraman from Channel 11, did he inform you as to whether or not he had an additional microphone connected to a cable on that...

Objection. That is leading...

Judge: Nah, no it isn't. No. Overruled. Go ahead.

A Actually, I talked to two people. I talked to a Edward Royal Boyd, he was a Channel 11 cameraman, and Matt Sinclair, who is a news reporter, and they advised me that the microphone was on a ten foot cable and it--usually it was, like, five to six feet to the right of the camera and the news reporter said he normally had the microphone in his hand. And he said once the shooting started, he got very close to the cameraman. He said they were crowded quite close together by the car, there.

Objection.

Objection. Move to strike your honor.

Defense: They said they were not going to put this man on to testify, so this is not going to come in as corroborative.

Judge: I--I'm going to permit it. It's overruled. Go ahead.

Q Thank you, your honor. Now, did you receive any information as to whether or not one or both of the microphones utilized by Mr. Boyd and Mr. Sinclair were in operation on that day?

A They specifically told me that they used just the one mike on the cable. And I asked him if he was using the one also on the camera --a separate one there, or something--and he said sometimes, you know,



at times they would attach the one with the cable onto the microphone of the camera itself. That day it was separate and that was the only microphone that was being used.

Q Okey. And on what date did Mr. Boyd and Mr. Sinclair tell you that, sir?

A On January 9, 1980.

Judge: You can pick a convenient time for recess, is this such a time, or do you want to proceed?

Prosecutor: We can certainly break here, your honor, yes, this would be fine.

Judge: Alright. Let's break here and come back in an hour, which is about seven minutes after one. Then, as I indicated, we'll go on to three o'clock and then I'm going to adjourn. Alright.

Def: ...told him, when Mr. Sinclair was in Quantico, Virginia, ah specifically having to do with the camera and microphone equipment, the basis for my motion to strike as for my objection contemporaneously is Rule 802 and 803 in that it is hearsay, it's clear that Mr. Koenig was allowed to testify for the truth in the matter (of serving?) (observing?) --that is, the location of certain persons and the microphone at the time the filming was being permitted. There is, so far as I can tell, no basis under Rule 803 that would be an exception to the hearsay rule that would permit this. Specifically, subsection 24, which in some cases permits evidence, ah, ah, which is more probative of the point than anything else that's reasonably available. Here, reasonable efforts have not been shown or conveyed to us, ah, concerning obtaining

Mr. Matthew Sinclair, it's simply been represented that Mr. Sinclair will not be called by the Government as a witness. Furthermore, we were not given any advance notice, ah, that the Government was going to propound this kind of evidence, ah, it simply came in and, ah, we were totally surprised for it.

Judge: Well, is--is the testimony of any real significance?

Defense: Yes, sir, it is extremely significant.

Judge: How's that?

?? Mr. Greeson, would you like to address the significance of that?

Mr. Greeson: Well, Mr. Sinclair--ah, well Mr. Boyd testified, your honor, he testified that, no, he did not tell the FBI that the microphone he was using could have been anywhere from eight to fourteen feet away from the camera. Mr. Koenig has testified twice--ah, nowhere in his testimony has he mentioned that he knew anything at all about the microphone being separated from the camera. In fact, he's testified, I believe, and I don't have it before me, and I could be wrong--he's testified that the microphone was attached to the camera, ah it's...

Judge: Yeah, but what...

Mr. Greeson: ...excuse me, it was obvious from Mr. Boyd's testimony yesterday that was not a fact that Mr. Koenig took into, ah, consideration and, ah, that's the reason why it's, ah, very important, ah, a discrepancy of the placement of the microphone in this case of eight to fourteen feet, ah, would just be absolutely phenomenal. It would change all of the calculations that he made.

Judge: Yeah, well, what did Boyd testify to?

Mr. Greeson: Boyd testified that he did not tell the FBI anything about where his microphone was.

Judge: What--what did he testify about concerning where the microphone actually was--what did Boyd say?

Mr. Greeson: Said it was all--it was attached to a cord, and that Mr. Sinclair was holding it at some distance from him, we asked him how far Mr. Sinclair was and he seemed to indicate that he had a third eye in the back of his head and could see him, which of course can be argued, but ah, ah, that the cord was, ah, as much as fourteen-- he could be as much as fourteen feet away from it, ah, because the cord was that long it would allow him to be there and that he didn't keep his eyes on him at all times and didn't know where he was.

Judge: Alright, so.

Prosecutor: Your honor, I believe Mr. Boyd's testimony was that he did recall that Mr. Sinclair was frequently close to him and did frequently bump into him as a matter of fact. Ah, he did testify that the cable length was ten to fourteen feet, I believe, and that it might have been stretched over a car--car's width, but he doubted it because there would have been tension on the cable. In any event, your honor, the United States would submit that the type of data to which Mr. Koenig has testified, the data he collected preliminary to his investigation in this case is explicitly admissible under Rule 703 of the Federal Rules of Evidence. It is precisely this type of data upon which an expert is permitted to base his opinion and the United States would submit that facts and circumstances surrounding how a magnetic tape was recorded does

come--does fit perfectly within the requirement in Rule 703 that it is the type of information reasonably relied upon by experts in this field of magnetic tape analysis when they conduct their analysis of magnetic tape. We would submit that, ah, for that purpose, ah, of informing Mr. Koenig as to the circumstances under which these magnetic tapes were recorded, that it is something he reasonably relied upon in forming his opinion, and he, of course, is subject to cross examination as to those conversations, but we submit that Rule 703 does permit its admission.

Judge:        Alright. I've heard enough on it. I'll rule that it's admissible under Rule 703. I'll deny your objections. Alright.

Defense: Your honor, (inaudible) to also object while the jury's still out, the introduction of D24 which is a chart, which has been prepared by the Government to, ah, illustrate the testimony of Mr. Koenig, for the same reason that we've objected to all the other new charts. It's outside the period of time in which these exhibits are supposed to be prepared and shown to the defense. Ah, it has been shown to us several days ago, but it ah, and, ah, about a week or so ago--I can't remember exactly--in a small drawing which was shown to us. However, that was long past the deadline settled by this court. And for that reason we object to D24 as well.

Judge:        Alright. I'll overrule the objection. It can be used. Bring the jury in please.

Q        Mr. Koenig, you were discussing before the luncheon break, the conversation you had with Mr. Edward Boyd of Channel 11, concerning the types of equipment that he utilized on November 3, 1979. Did you

have similar conversations, sir, with Mr. Waters from Channel 8 concerning the types of equipment that he utilized in, ah, filming the, ah, video tape that he had shot?

A Yes, sir.

Q I'm sorry--Mr. Waters from Channel 2, is that correct?

A Yes.

Q What did he inform you as to the types of equipment he used and the circumstances under which the video tape was filmed?

A He again said he was using professional video broadcast quality recorders--recording.

Q Did he tell you anything as to his microphone?

A It was my understanding the microphone was attached to the camera.

Q And did he tell you what type of microphone he was using?

A I don't think he knew. He told me the type of tape recorder, but not the type of microphone.

Q Did Mr. Boyd tell you what type of microphones he had been using on November 3?

A Not specifically. He said it came with the equipment they used on that type of video equipment.

Q Did he tell you whether it was a directional, or a...

A Yes, he...

Objection. Objection to the leading your honor.

Objection. Man said he didn't know to tell him what kind it was.

Judge: I'll allow it. Why don't you ask him what kind he might

have told him he used.

Prosecutor: If I might, your honor, let me rephrase the question.

Judge: Alright. Rephrase it.

Q In your opinion, Mr. Koenig, given what you understood as to the circumstances on the--at the scene at Everitt and Carver on November 3, what difference might it have made for the purposes of your examination whether the microphone that was used was a directional microphone or a omni-directional microphone?

Mr. Greeson: I object to that your honor, please, he's already testified that he didn't know what type was at the scene.

Judge: Well, I think he can answer the question. Go ahead. You understand the question?

A Yes, sir.

Judge: Alright, go ahead.

Q Please speak up, if you would, Mr. Koenig.

A There are many types of microphones. Two of the more standard types are omni-directional, and these are the kind that picks up everything that happens in the room. For instance this would be an omni-directional type mike. It'll pick up someone over there as well as it will pick up someone over here. These types of mikes, so this could be omni-directional, tend to be a little more directional, without being in a certain direction. However, even om--directional mikes aren't that directional. In other words, if this was a directional mike and I pointed it directly at me and somebody talked over there, it would probably still pick up on the microphone. In fact, I'm involved with

always be exacting on, it's more difficult to be definitive of (???) shot.

Q Sir, with regard to the first category of information you were just discussing, the number of gunshots that you were able to identify, can you tell us whether, in making that determination, you relied upon the video tapes as well as the audio tapes or did you just examine the audio portion of those video tapes to determine how many gunshots were fired that day?

A We only used the audio portion to determine that.

Q Would you briefly describe to the jury the procedures--the steps you went through in making that determination?

A Yes, sir. Sound waves that I mentioned briefly, that we looked at and determined what was a gunshot and what was something else. So we had to have a visual display of this wave length, as we call it, and so. Again, I mention, like a hospital scene, you see the heart's beating on this monitor, and we can put that on paper, six inch wide or twelve inch wide paper and spread that out. In fact, most of the exams here were done with spreads of (???) I had resolution of better than one ten-thousandths of a second. And, from that I can actually look at the sound of the gunshot blast itself, makes--it--it--very unique type of sound, for a number of reasons. First of all, if it's super-sonic, that is preceded--since a super-sonic boom, faster than the speed of sound--in other words, the gunshot goes off and before the sound of that gunshot go off, the bullet is faster than that sound, it actually gets there before the sound of the blast does. So you get this particular wave, it's called 'N' wave that shows that bullet is super-sonic. And only a

super-sonic projectile would have a 'N' wave. The 'N' wave would sound like a sonic boom. I remember when I was a kid, they used to still fly jets across the country and once in a while they'd break the sound barrier and you'd hear this boom. Well, that's what's happening with the bullet. And a bullet is much smaller than an Air Force jet, so the sound wouldn't be as loud, but it's--it's a sound that a lot of people perceive as a crack of lightning--like it's the blast and then the crack itself--it's a very sharp sound. So, only a bullet being fired super-sonically would have it. So if we found that characteristic, that alone would tell us enough to say it had to be a gunshot. That, you can't bang a car so hard that it's going to be super-sonic. It's impossible. Second, the gunshot blast is extremely high amplitude, short duration. In other words, they occur very quickly, and very sharp--it's very unique. If you look at the wave form, you come along and there's no sound at all; just "wham" it goes straight up and then comes straight down again. Other sounds like banging the microphone, banging the side of a car, even a firecracker and a car backfiring, do not rise as fast, they're just not as sharp a sound. We've even run tests with things like military ballistics--explosives--and we can't get anything else to look exactly like a gunshot was. So what we look for is, again, this set of very sharp rise, very quick falloff, high amplitude, just any way (inaudible) super-sonic not all gunshot blasts are. And you look at--for instance, you're going to see echos, in other words, you make a very loud sound, if you heard a report--bounce around the courtroom. Well, most loud sounds do that, so that's not a



real valid--. But the point is, if somebody just banged the microphone, which happens on tape, there wouldn't be any echo, all you're hearing it is internally in this microphone and it doesn't echo. So if we see a sharp sound and there's nothing after, it's just very clean, most likely it's somebody bumped the microphone. The other thing we do is listen to it very carefully, not at normal speed. Again, it's very difficult to tell just listening to something at regular speed. We slow the tape down like to one-sixteenth speed, or even slower, and listen to it. And what happens there's a lot of sounds that sound very sharp, aren't sharp anymore. Ah, and people sounds like you're talking so slow it almost sounds like you're a cow mooing--a very funny sound. And--but these other sounds that sounded like somebody really (noise) banging like that; now we hear it at slow speed it's like (noise) but that gunshot blast is still sharp--it's very, very sharp. So we went through and we looked at all Channel 2 and Channel 11 tapes, at anything that could be a gunshot. And I went through the first time and reached one time about fifty-some that I thought could be. And we ran them at low speed. We only ran the-- there where we--resolution may be a one-hundredth of a second. Then we took all of these that we thought there was any chance it would be a gunshot and ran it at very high relief. To give you an idea, the paper coming out of the machine--the paper was twelve inches wide--comes out of the machine at 200 inches per second. And you really don't want to stand in front of this, it might hurt you. And it allows us to take, in other words, give you 200 inches of paper, for one second. So, we just spread this out all across our floor there in the laboratory and

and we look at what's there. And from this we can see this very sharp rise time--this 'N' wave characteristic of your super-sonic and very quick falloff and everything else looks different. And to assure this we've run (inaudible) over the years. We ran a whole set of tests with general types of weapons used in this matter. Put microphones in all kinds of different directions. Fired them over the mikes and to the side of the mikes and everything we could think of--ran hundreds of tests, to insure that, in every case, we can pick out a gunshot (inaudible), and the gunshot can be very, very weak. So then we went through this whole thing and picked out a total of 39 gunshots and the timed ones-- or the ones with time, were shot at the scene.

Q Now, Mr. Koenig, you refer to, ah, these sharp-type movements on the ah, audio portion of the graph you see of this audio portion. What do you call these sharp movements in the--in the wave there?

A We call very sharp sounds a transient sound, a very--well, I guess in normal non-scientific language that would be a very short happening. In technical terms, again, it means a very extremely short sound occurred.

Q And, sir, what do you call the, ah, the type of graph that you were describing where you were able to print out up to 200 inches per second?

A A visicorter graph, V-I-S-I-C-O-R-T-E-R.

Q Now, you testified that you had initially identified 50 or above 50 transients on the audio tapes from Channels 2 and 11, is that correct?

A Yes, sir.

Q Now, can you describe the procedure that you went through to determine which of those transients were actually gunshots?

A We ran them at this very high speed on the visicorter, this paper spreading this at 200 inches of paper for each second. We visually looked at them, looked for things like 'N' waves, looked at how the transient peak came up, and then also listened to it, at the slower speed--really spent a lot of time. It wasn't that difficult. Gunshots are very unique. It's not like we had to sit there and agonize for two days over whether something was a gunshot. Once we got sufficient resolution to be able to run something like that, we did it. In fact we have a special visicorter, ah--if you think of a visicorter, most visicorters are mechanical in nature and they have a pin that moves up and down the paper. Well, you can imagine, that could be a real problem when you're running this paper at 2 inch--200 inches per second. The pin won't move fast enough. So we've--ah--have developed--ah--with the Army--ah--a special visicorter to do (inaudible) it's optical. In other words, it's a light wave that moves across the paper which it can do very, very quickly. And that allows us to look at transients responses--that's what that type of equipment is made for--that's what the military also wants it for.

Q And the analysis you conducted on these audio tapes utilized that--an optical visicorter, is that correct?

A Yes, sir.

Q Now, how--how were you able to determine, Mr. Koenig, ah,--or

were you able to determine, sir, whether or not two gunshots had been fired at exactly or identically the same second at the scene at Everitt and Carver?

A That's an excellent question. First off, we have extreme resolution, in other words it would have had to been fired within one-two hundred thousandths of a second. Now we really ran a few tests to see if we could do that mechanically; what happens is the triggering mechanism in the guns are such that, even if you pull the triggers exactly the same, the bullet doesn't explode exactly the same. I mean, to you listening to it it does, but when you start graphing it out you can see the difference. Second, these shots produce echos and if they're shot at the same time, even if they're a couple of inches apart, you would get a different set of echos. Third, what if one was supersonic and one wasn't ...(inaudible)...you know, they should both be the same. Another (inaudible)...you would tend to have two shots fired at the same time, they wouldn't be right next to each other, you wouldn't have the guns sitting against each other. One would be over here and one would be over there or someplace. Well, remember I talked about the speed of sound, well if you figure that the speed of sound is approximately one foot for every one-thousandths of a second, well what if one of those guns was fired at exactly the same time was one foot apart--one foot farther away from the microphone than the other. Then one would arrive one millisecond--one thousandths of a second--later. We're talking, we have ten thousand--more than ten-thousandths per second resolution; therefore we'd immediately spot it. We also--other problems.

What happens is, the wave forms kind of interact with each other to produce a phony wave form. You know, you look at it and you say there's something wrong with it, because you'd never get the phase exactly right. And it was a problem that we really spent a lot of time on to insure that that could not happen. It was our opinion it would be virtually impossible (inaudible)...simultaneous shot (inaudible). So we're stuck here with only tenths of a second apart and we easily resolved them. Tenths of a second apart, to us, is almost forever with these charts, you know, feet of paper apart. So, the chances of a simultaneous gunshot was missing (inaudible).

Q Ah, Mr. Koenig, ah, what were the chances of your having missed a gunshot, ah, because the gun might have had a silencer on it?

A Our laboratory, ah--other people in the laboratory division-- did a lot of work with silencers. It was, ah--we got to determine if something is a silencer. Somebody's charged with the offense of having a silencer, it--it is illegal. We got to prove it's a silencer. Just because it screws on the end of the barrel of a gun, doesn't mean it silences the gun. And we test it to see if it reduces the amplitude sufficiently. Okey. A good silencer might reduce the amplitude 20 decibals, that's, ah, terminology we use for how loud something is. And, when you figure a gunshot that's fairly close might have a, ah, amplitude of, let's say 120 decibals. That would be about the same as what my kids play rock and roll on their radio at home, very, very loud. Like, okey. If you reduce it to a hundred, to you, you would say that music is still extremely loud--just not--you know, you're like getting

a headache when you stand there for twenty minutes. It does--a silencer, no matter what the movies show, don't silence a gun from very loud to very soft. It reduces it somewhat, and that's all it does with it. If it tends to reduce it more than that, what happens is it--it knocks the bullet all over the place. In other words, it wouldn't even be accurate at twenty feet. So, you almost have to put the gun up against somebody's head if you reduce it more than that. And these are the results of hundreds of tests with silencers we did; it was some tests (???) to law enforcement agencies of this country. So the silencer would have minimal effect.

Q In your opinion, Mr. Koenig, is it possible that you missed a shot, ah, because the gun had been, ah, ah, (???) a silence (???)?

A No way.

Q Now, how many gunshots did you conclude, Mr. Koenig, were fired at the intersection of Everitt and Carver on November 3, 1979?

Objection.

Objection. I assume he means does he have any opinion about that.

Judge: Yes. Do you have an opinion? (Noise)

Q What is your opinion, sir?

A Ah, there were 39 gunshots fired, you might say, recorded on that tape.

?? I'm sorry, your honor, I didn't hear the--I didn't hear the full response.

Judge: What was the response?

A There was 39 gunshots recorded on that tape.

?? Thank you.

Q After determining the number of gunshots, Mr. Koenig, did you make any attempt to correlate that information with the visual information that appeared on the video tape?

A Yes, sir.

Defense: (Inaudible) although we don't object to Mr. Koenig's testimony, we do object to this exhibit.

?? Your honor, (inaudible).

Judge: Alright. You want to come up?

Q May the witness step down?

Judge: Yes. Now, ladies and gentlemen, this is what we call a demonstrative exhibit. The witness, I presume, will testify to certain matters and what's reflected on this chart purports to be what his view of the, ah, evidence is and what his opinion shows. Now, you're not bound by what appears on this exhibit. This is just the witness's opinion. You can look at that, and you can view his testimony; at some future time you might look at that chart and say I reject all of it. So you're not bound by what--what's on that, do you understand that? Alright. Or you may accept all of it, it's up to you, you're the judges of the facts. Alright.

Q Now, Mr. Koenig, you testified that after determining the number of gunshot sounds that were recorded on these video tapes, that you then viewed the visual portion of those video tapes and determined certain additional facts. Were you able, sir, to determine the times that those gunshots occurred?

A Yes, sir.

Q Alright. Would you stand to that side of--I show you what has been marked for identification as Government's Exhibit D5, and I would ask you to, beginning with this column right here, explain to the court and the members of the jury, ah, what conclusions you made as to the time at which these gunshots were fired. And, first, if you would, describe the significance of the numbers contained in the upper portion of this diagram?

Defense: I assume, once again, he's asking for the witness's opinion, your honor. I object to the form of questioning.

Judge: Yeah. This is all opinion testimony, and you heard me explain, ah, an expert may, ah, express an opinion. So he--this gentleman is expressing his expert opinion on these matters. Which you may accept or reject. Alright.

Q Please go ahead.

A Okey. I timed these 39 gunshots (inaudible) one (inaudible) to milliseconds, very, very short duration. Then I related that to the time code which was printed on the Channel 11 video tape. So, really, this timing is, in my mind, is accurate as far as the time code is on the video tape, but that's not as accurate as actually my research showed. So this tells you where on the video tape it occurs. So what I did was, it starts at 11:28:12--the time code off the video tape, it has nothing to do with the time of day, that's just the numbers for the video tape--and it runs all the way up to 12:56:23. And, you do a little bit of arithmetic there, it runs a little bit over 88 seconds. All 39



gunshots were fired in a little over 88 seconds. What this is, is--I put the time the shots occurred on the video tape. Now, often you don't see anybody shooting, on the video tape at that time. It's just that that's when it occurred. So then, we have 39 gunshots, all listed (inaudible). A shot at 11:28:12, the first one; and 11:50:25, which you notice is about 22 seconds later, the second shot occurred, so you have a pretty good range between those shots. Then we go off and about .4 seconds later (inaudible) we get the third shot, and then a fourth and a fifth. And this just goes right on through here, like that. You'll notice some of the shots are quite close. Right here, look at that, only five digits apart here. Some gunshots are very, very close in time. I'm going all the way across, every one of these are-- up to the 39th shot--which occurred 12:56:23.

Q Now, directing your attention to the left-hand column on this chart, Mr. Koenig, can you tell the members of the jury what that information is?

A Okey. From the echos of the recorder, I was able to determine spacial things, the location of each of the gunshots; where they occur. So what was done here was broken down. Some of the shots were the far west part of the intersection. Some of the shots were the southeast side of the intersection. Some--three I couldn't determine-- it was, I know they're gunshots, but they have so few of these reflecting echos, that I can't even tell you where they came from. I can tell you where they didn't come from. But not positively where they did come from. Some were from--on the--this would be the west side of 1700

Carver Road. Some were over by the recreation building. And some were from the south side of the street--in fact only one was from the south side of the street.

Q Now, have you had an opportunity, prior to today, Mr. Koenig, to examine this chart?

A Yes, sir.

Q And the times that are contained on this chart?

A Yes, sir, they matched our report with that.

Q Alright. Does this chart accurately summarize certain portions of your conclusions?

A Yes, sir.

Q Thank you. Now, Mr. Koenig, you made reference to the process whereby you were able to locate, in your opinion, the places from which the shots were fired, these 36 and 39 shots were fired. Prior to your coming to court today, did you prepare a diagram that would illustrate the method whereby you were able to make the location determinations?

A Yes, sir.

Q May the witness again step down, your honor?

Judge: Alright.

Q Mr. Koenig, I show you what has been marked for identification as Government's Exhibit D24 and ask you to identify that exhibit, sir?

A That's an example of how to do this procedure to determine where a gunshot came from under excellent recording conditions.

Q Alright. Utilizing this diagram, Mr. Koenig, would you explain again to the court and members of the jury, the procedure whereby

you were able to locate these gunshots?

A Okey, when a gunshot--a gun is fired--the sound goes in every direction. In other words, if somebody is standing in front of you and they shoot a gun off, you're going to hear it behind him, even though they pointed the gun in the other direction. The sound waves go in all directions. It's like having a nice calm pond and you throw a little pebble into it, and it goes out in all the directions, that's what sound does. If you think about it, it always happens. Now, it's more obvious in very loud sounds. Sometimes, when somebody's talking and you're behind something, you have trouble understanding. But a loud sound, you hear--a car can backfire three blocks away and you can hear it. And lightning can go off miles away and you hear, the thunder it comes from. So this sound goes in all directions, okey. Well, some of it goes right from the gun right to the microphone. Now that takes a certain length of time. Remember we talked about that--speed of sound is at a certain speed. Now, we determined on that day, at the temperature, the speed of sound was 1,113 feet per second, okey. So, if you go from here to here, and we just--decided to make that 210 feet, it would take about .19 seconds about a fifth of a second to go that distance. And remember we talked about, that every thousand feet takes about a second. So if you divide a thousand by 200 feet, so--a gunshot goes along, and you don't even hear it in the microphone until about, you know, a fifth of a second. But, again, it's going everywhere; some of it's bounced up here (inaudible), just keeps going, goes straight up, (inaudible). What happens to this one? It comes over and hits this building.

Q Would you identify the color?

A It's blue. Hitting building G. Okey. It hits the building, just like the billiard shot, or the pool shot, where, you have no english on the ball, and you hit it and it banks. You've all seen people that play pool very well, and he knows his angles. It has to hit--if it hits at a certain angle--it has to come off at a certain angle. It's the law of physics. Can't change. The same thing happens to light. You shine a light onto a mirror or something, exactly the same thing. When you look at your reflection in the mirror every morning, it has to reflect right back. You don't look in the mirror and your face is over here. It's right in front of you every day. Same way with sound, it's a type of wave, just like light waves. So it bounces off in an exact way. In other words, if anything's here and it comes down and these angles match up, it'll come right to the microphone, okey. But there's also a sound wave coming up above the (???) mark, and where does it go? When it hits at an angle it comes down here somewhere. And one come over here--it hit here--it'll miss the microphone, you won't even hear it. So you say, okey, you hear an echo. Well what happens to this path? Well blue path is a hundred feet longer--take longer to arrive. In other words, if three--if you started out walking two people at the same speed, one took this path and one took this path--unless the guy on the blue path was a jogger and the other guy was walking--this guy is going to get here sooner; and this one has to go a hundred feet further, and he arrived after the original person did. So we got the one gunshot coming over, you get your nice peak here, just what it looks

like in the wave. This other one takes longer to get there. Well what happens to (???) ...blue? When it arrives, nine hundredths of a second later. Which to your ear, you might not overhear. But there are wave forms all spread out, it's just like this, they're all (inaudible). ... (inaudible). Same way, this is 260 feet. That's 50 feet longer. So we ended up here (inaudible) about five hundredths of a second later. So then you get this gunshot here--the original gunshot--here's (inaudible) Now you say, well, gee, how unique is that? Well, if you move the gun up here, what's going to happen is you make them peak at the same--this path's the same--a lot of these are the same distance--you're now closer to this building. So this wave will move slightly. And you're farther away from this building, so this one will move this way. So what I could do was sit there on--on a (???) and say, okey, let's try these positions. I take the microphones here and I take the guns there. If I'm wrong, they will not match up. One of the gunshots on there--can I ask, did the jury see the video tapes?

Q Ah, we'll get to the video tapes later, Mr. Koenig.

A So, what happens is, if I get anything wrong--let's say I decide the microphone's in (???), (inaudible) and I place it here, and I have this wave come down here, and I think the gun went off here. And I get a wave form, I--I make all these actions for the buildings, I know how they have to bounce off all the buildings--it won't work. (inaudible). Maybe I got the microphone in the wrong place. So I move that over here and--gee, that's a little bit closer (inaudible). So finally I move it around and I get the gun in the right position. It matches. And it's

unique for that position. There's no way that it could be in a different place. It has to be there. Now, as I said, we ran tests where I'd move it a foot, and I could tell the difference. And if I moved it, backed it up five feet, it wouldn't match at all. That's how accurate this technique is. So you have this set of echos that accurately define both the microphone position and the gun position. So that's why I needed to have these charts of the various buildings. I also needed to know where the cars were. You get a certain amount of reflections off, like, car windshields and the sides of cars. And then I get this wave form with all these echos and I can sit there and define, exactly, where that gunshot had occurred.

Q Now, Mr. Koenig, how did you determine the location in which-- the location of the microphone--in your analysis of these video tapes?

A Preliminary way was basic photogramatic--metric--techniques, where you just line the camera up and you get that. Now, I didn't have to be exact about it. Simply, for one reason, the microphone in Boyd's hands wasn't even in the camera, it was on a cable when he talked. And I was interested in where the microphone was, so (inaudible) the general area, approximate area, where the microphone had to be. And then if I aimed visual information, at all, let's say I thought that I saw the person fire at that point--something--well, I know which point (inaudible). If I did that, it would be correct, it would match. And I did that, you know, you have a conception that this is what happened, and get a wave form, and that's not what happened. Or (inaudible) what's called fore-shortening. If I take a picture of this wave, if I use a

regular lens, and a telephoto lens, taking pictures of a man--if I don't know what kind of lens I used--I'm going to think he's closer than he is or further away. So the visual, to me, could be confusing. This way, it had to match. Now, if we're in the wrong place, it did not. One of the reasons the exam took so long was some of the shots had no visual information. I mean--approximately, like--I didn't know who the shooter was-- I had no idea. So I'd sit there and say, okey, well I have this echo, and let's try it this way. Then I'd go put the point there, and I'd try it, and it didn't work. And then, finally, started to get lucky, you know, if you try enough points. Sooner or later, the points started matching. Then I said, that's it. Now, it's fortunate a lot of the gunshots came from--sometimes--from the same general area. So I'd get a gunshot and say, okey, this was fired from the same general area, then I'd just have to move it a little bit to make it match. It's--It's a basic physics exam. Time consuming, but not really complicated. It's just simply the echos that take longer 'cause they travel farther.

Q Did you go through the procedure you just described in locating each of the 36 shots which you have said you were able, in your opinion, to locate?

A There was a couple of shots where there was no echo. And I got this nice pattern, it was just the thing, and I said that's a gunshot. And then (inaudible) . Three of those, I couldn't determine. But several, I was able to determine because I could see who was firing the gun. I knew the gun went off at that point and I could see where the persons feet were standing on the sidewalk and I could make a decision.

There was, I think, two of those. That type, where I based it entirely on visual. But, anybody could see that, you could see the person shooting on the screen. So I located where those people were on my map, (inaudible).

Q Now, in your determination of the location of these gunshots, Mr. Koenig, did you take into consideration certain technical error rates in the data that you had been provided?

A Yes, sir.

Q Could you, in some detail, describe to the court and to the jury just what you considered to be potential sources of error in the course of your examination and how you factored them into your examination?

A Yes, sir. First error we have is, it was recorded on video tape. How accurate is the video tape recorder that's being used. We were very fortunate with that. Video tape recorders have to be quite accurate, speed-wise, or they don't work. They start flickering, and everything else. So they have to be quite accurate speed. We got from the manufacturer the maximum speed error that unit could run. We had to play it back, so there's the second one. You got the original, whatever errors on that, and you got to play the tape back on something. No matter how good the equipment is, you have a certain amount of error. And then we talked to the manufacturer and he told us the maximum error (inaudible)--not very large. Third, we copied it onto another reel. There's where we've gotten into the errors of recording. I put a very high quality, accurate time code onto this



wave form information, right below it. It's accurate--to give you an idea--if you put--(inaudible) point two-three, this thing is accurate to the point eight zeros one (.000000001). It gets so accurate that it really doesn't effect that much. And what we did is make all the measurements in wave form up to that coding we had. So even if the tape recorder's off fifty percent, it wouldn't make any difference, 'cause the time code would be off fifty percent, we'd just adjust it. So there are the errors of the tape recording. Second, there's a limit to how accurate I can measure them out. I mean, I can measure quite accurately, but not perfectly. I mean, you get down, and you're talking about one-thirty-second of an inch and then you start talking how accurate can I be between that and one sixty-fourths of an inch. So I considered that. Ah, the other way to check their--we went through a few other things, just, like, for instance, I took the speed of sound at eleven hundred and thirteen feet per second. Because it--this occurred, I believe, at eleven thirty in the morning. The hourly temperature before was fifty-four and the hourly temperature after was fifty-six, at the airport. So I took fifty-five. But to make sure it was accurate, I made it plus or minus five degrees--so it could be fifty to sixty degrees, you know, its a very wide error range. So we went through with any of these corrections we could. We also double checked. Most of the shots (inaudible)--in fact most of the shots, two cameramen, Channel--Channel 2 and 11, were right near each other. So therefore, the wave forms should match up providing you use cameras--not exactly the same--they should never do that--but close. Now, we should show they're within ten feet of each

other. I went through all the gunshots. The first gunshot is not on Channel 2, the rest of them are. And they all match up within ten milliseconds--I talked about a millisecond, a thousandths of a second--or about one foot, all of them (inaudible). And then, I just threw in an error factor beyond that, which added on (inaudible) just to make sure. And most of the shots I determined within plus or minus three feet. Actual accuracy and error rate we think possible is probably plus or minus (inaudible). But, just to be totally confident, in case the map we were using, or the area's off a little bit or something, we just made it plus or minus (inaudible) that was the lowest we could (inaudible). Actually, some of the shots--you'd see someone fire three shots in three-quarters of a second, okey. I mean, that person is just going "poof, poof, poof", pulling the trigger as fast as she could. We could see the slight movement where she moved (inaudible) every time she fired. I mean, the technique is exceedingly accurate.

Q     Alright, sir. Please retake the stand, thank you. ...your examination--in the course of your analysis and examination of the video tapes and the acoustical tapes, did you utilize the video information on both the Channel 11 and the Channel 2 tapes?

A     Yes, sir. We used all the information we could get that will help us with the exam.

Q     Alright. Your honor, at this time I would request that, ah, Government's Exhibit 2b, which has previously been admitted into evidence, be played for the jury.

Judge:     Very well.

Q Your honor, I would, ah, request also that, ah, during the next portion of Mr. Koenig's testimony, that portions of VT1b, that has been admitted into evidence, be displayed for the jury as well.

Judge: Very well.

Q Mr. Koenig, before I slide this back momentarily, referring now to Government's D5, you discussed the time legend that occurs across the top of that. Which channel was that from, sir?

A Channel 11.

Q Alright. And that's the time code that appears on that video tape?

A Yes, sir.

Q Now, Mr. Koenig, I ask you to examine Government's Exhibit D10 and plastic overlay D1b, both of which have been admitted into evidence, and I ask you if the information contained on Government's D10 accurately summarizes the information as to placement of vehicles, location of buildings,--and the location of buildings at the intersection of Everitt and Carver upon which you based your examination?

Defense: Your honor, I believe our objection will show that, ah, that we previously objected, but not as to this exhibit, so I'd like to simply have that directed.

Judge: (inaudible)...directed. Same rule.

Q This--this summarizes the underlying maps you were looking at, right?

A Yes, sir.

Q Now, you testified earlier, Mr. Koenig, that when you initially

examined the audio portions of the video tapes that you had identified fifty-some odd transients, but that after further analysis you concluded that there were, in your opinion, thirty-nine gunshots...

Defense: I object to, ah, the leading and the repetition and, ah, Mr. (???) testified to the fact, he can answer...

Judge: I think it's an appropriate question. Objection overruled.

Q My question, sir, is whether or not, on the Channel 11 tape-- the audio tape from the Channel 11 video tape--whether you identified any transients occurring before what you later determined to be the first gunshot?

Defense: Object to leading.

Defense: Object to the form of the question.

Judge: Overruled. Go ahead. Do you understand the question?

A Yes, sir. I identified one transient that could possibly be a gunshot, but further analysis was not...

Q Alright. How did you rule that out, sir, as not being a gunshot?

A I don't remember particulars. But, again, when I looked at the characteristics of it, and, on the first run-through, we took anything that looked like it could possibly be a gunshot. And then we started blowing them up and went to at least (inaudible) twenty-five five hundred centimeter (inaudible). Blew it up twenty times the resolution. And when we made that next step, we were able to say that isn't (inaudible) --it had--it could not be a gunshot (inaudible).

Q Ah, if we could play (tape plays). Now, Mr. Koenig, do you

recognize the video tape we are now viewing?

A Yes, sir. This is the Channel 11 video tape.

Q Now, my question to you, sir, ah--I will pose a question and then I will ask that we run a portion of this video tape and I'll ask you to answer the question after the portion of the video tape has been run. The time now that appears on the video tape at this point is ten minutes, three seconds and eleven thirtieths of a second. And my question to you is: given the location of this television camera, between this point in time and the point in time where you have identified the first shot, my question to you sir wheth--will be whether or not, prior to the shot that, in your opinion, was the first shot fired that day, there is any possibility whatsoever that there was a previous gunshot fired somewhere between the location you have identified as being the location of the first shot and the intersection of Everitt and Carver?

Objection...

Your honor...

Your honor, I object because this witness has not testified that there was thirty-nine shots fired that day. He has testified there were thirty-nine shots recorded that day. He hasn't got any information about any shots fired that day that were not recorded. Now, Mr. Linsin asked him about the first shot fired that day. This witness is only qualified to testify about the first shot recorded in his opinion. But not about any shots fired.

Defense: And he's obviously cross-examining his own witness, your honor, please, the way he kept--phrased the question.

Judge: I'll permit the question. You may proceed.

Q Alright, may we view the video tape, then....(tape plays)

Do you recall the question, sir?

A Yes. There was no gunshot until we reached this point.

Q Now, Mr. Koenig, referring to the large diagram that has been designated D10, and has been accepted into evidence, and the overlay that has been marked as D10p, I ask you to refer to both of them, sir, and describe for the jury how you were able, in your opinion, to locate the placement of the first shot that was fired on that day?

A In this shot, we do have some visual information. We reach a point where we see some blue smoke.

Q Might I just--interject that the point on the video to which you are now referring is eleven minutes, twenty-eight seconds and twenty-one thirtieths of a second, it's actually nine-thirtieths of a second beyond the time, ah, you previously testified the first shot had occurred.

A We see some blue smoke coming up from one of these--we use a slow motion video--(inaudible)--and we can see some blue smoke down in this direction--the cameraman is up in this area. So, again, that wouldn't prove that was a gunshot. It could have been anything--blue smoke. What we did was, just to get it started, we (inaudible) photo (metric?) technique and tried to get it somewhere (inaudible) the camera. There's a couple that was used right before the shot and after--tried to get an approximate--approximation. Then we said, well, (???) one is a gunshot then we'll know it's a gun. (inaudible)...we started working our way down in the direction to see if we could find (inaudible)...and back to

..

this echo analysis. If we're wrong, well there it went. And we finally raised a match--it was down here--with the gunshot going off the side of the bus. And not only did the echos match, but a lot of other things, especially one thing occurred in (inaudible). This echo off this building (inaudible)...right off this building, very large echo, it was muffled somewhat by this bus. It was still there, but the side of the bus muffled the shots, which it should have done. Had this echo been very clear, that person couldn't have (inaudible). (Inaudible)...and our echo analysis put it right in that area (inaudible) echo matched it up. So then we broke these divisions (inaudible) to get a placement where the gunshot almost had to be. And it was just simply a matter of going--drawing all the lines, putting it in one position where we thought it was, that didn't match. Moving it slightly. We finally found the area where it had to have been. That ended up being just south of the school bus.

Q Were you, Mr. Koenig, in the course of your analysis, able to identify the person who fired the first shot on that day?

A Certainly not that (inaudible). There was a shot, right after that, of an individual with a gun sticking out of a pickup truck in this location. Again, the time (inaudible) I can't be positive--somebody could have come up next to the truck and fired a shot (inaudible).

Q Do you have an opinion as to who fired the first shot on that day, sir?

A No, sir.

Q Your honor, I would just ask Mr. Brereton to slowly advance the

video tape so the jury may view the smoke to which Mr. Koenig had just referred in his testimony.

A Right there, you can see the smoke.

Judge: Smoke. Where's the smoke?

Q Your honor, perhaps Mr. Koenig could point on the video, for the benefit of the jury, the placement where he sees smoke rising and, Mr. Koenig, if you would for the record sir, describe in as much detail as you can, by use of the description of the clothing and hats and anything else, the area in which you see smoke rising.

A If you're looking in the upper middle third screen here, right by this blue hardhat.

Q I think perhaps we could step to the side, the ah (inaudible).

A What you'll do is, you'll see some white smoke (inaudible). Again, when we saw this, we didn't know if it had anything to do with a gunshot. We started out there (inaudible)...(tape plays)...difficult to see. I looked at this thing thousands of times, and ah. Here again anything that might have been incorrect, the echos wouldn't have matched up. So this was just to kind of help us...

Your honor I object to the lecture without a question.

Judge: Ask the next question.

Q Mr. Koenig, directing your attention to D10 and the overlay that is now on it--well, first of all, would you indicate to the jury where, in your opinion, the first shot was fired on that day?

Objection.

Judge: Overruled.



A It was found just south of the school bus (inaudible). Vehicle number 11.

Q And is there something on the overlay which indicates the placement of that shot?

A Yes, there is. An orange sticker.

Q And this overlay D10b, Mr. Koenig?

A Yes, sir.

Q Now, with reference to the second shot you determined as having been fired on that day...

Judge: Mr. Linsin, we have about ten more minutes, if you want to pick an appropriate time.

Q Yes, your honor. My thinking was--this shot, and then...

Judge: Alright.

Q With reference to the second shot that was fired on that day, sir, what information did you have to assist you in developing an opinion as to the location of that second shot?

A There was no video information (inaudible).

Q What other information did you go by sir?

A I used the audio track and the video tapes of Channel 11 and 2 and used a (???) analysis and you kind of see you pick up echos off this building, various vehicles down here, buildings over here and we used this all in the placement of the cameras, and they find us the slot where the microphone and gunshot occurred; it had to be here.

Q Alright. I would just ask Mr. Brereton to advance the video tape to the point in time that Mr. Koenig determined gunshot number two was fired. (tape plays)

Q May the record reflect that we have stopped at 11:51 and zero thirtieths of a second, which is five thirtieths of a second beyond where Mr. Koenig indicated this shot had occurred. Now, did you utilize this visual information, Mr. Koenig, that you see on the screen now to assist you in placing where the camera was when shot number two was fired?

A Yes, sir.

Q And, referring to the overlay on D10b, would you indicate to the court and the members of the jury where you concluded the second shot was fired from on that day?

Objection to the form of referring to it as the second shot fired, your honor. Had to be the second shot recorded.

Judge: Well, the second shot recorded.

Defense: Yes, sir.

Judge: Yes.

Prosecutor: Your honor, I believe the witness has testified that it was his conclusion there were 39 shots fired on that day...

Judge: Wait a minute, is he saying--prepared to say--this is the second shot fired out of 39?

Q Are you prepared to state that this is the second shot fired during the period of time that the cameras were running and the video tapes that you had examined?

A Yes, sir.

Judge: Alright. Go ahead.

Q Would you then show the court in reference to D10b, to the court and the jury, where you concluded the second shot fired was located?

Defense: Object to the use of the term "conclusion", your honor.

Judge: Overruled. Go ahead. Does--does everybody understand that this witness is giving his expert opinion? Go ahead.

A Gunshot number two, I have marked it as--it has a sticker with number two on it. And it's located between Vehicles 38 and 37, south of Vehicle 43.

Q Now as to either shot one or shot two, were you able to determine whether or not the shots were supersonic or subsonic?

A Shot number one is probably subsonic. And shot number two is probably supersonic. I saw an indication of the one that was supersonic-- 'N' waves, I talked about previously.

Q Alright. And were you able to identify the person who fired shot number two?

A No, sir.

Q Your honor, I believe this would be an appropriate time to ah...

Judge: Alright. Very well. Ladies and gentlemen, we'll adjourn now for the weekend and resume this trial Monday morning. Please report to the jury room at a quarter to nine, Monday morning. And remember my admonition not to discuss the case among yourselves nor with anyone else. Not to read the newspapers about the case or listen to anything on the radio about the case, or watch or listen to anything on T.V. about the case. So, with that, we'll adjourn. I hope you have a very pleasant weekend and look forward to seeing you at a quarter to nine, Monday morning. Thank you.

(Court adjourned)

Q You testified last week concerning certain information you had received about the equipment that was used by the Channel 11 and the Channel 2 camera crews on November 3 at Everitt and Carver. Now, sir, given what you understand as to the quality of that equipment and the type of equipment that was used, do you have an opinion as to the maximum distance from one of those microphones at which a gunshot fired on the street would have been recorded?

Objection.

Objection.

Judge: Well, he's an expert, he can give his opinion. And as I explained to you earlier, ladies and gentlemen of the jury, an expert can give his opinion and it's up to you to decide whether to believe it or not; whether there is a sound basis for the opinion. And that's the test you apply to the testimony of any expert. So bear that in mind. Alright. Go ahead.

A A gunshot is a very loud sound...

Defense: No, objection. Unless he has an opinion. He hasn't said he has an opinion yet.

Judge: Yes. Do you have an opinion sir?

A Ah, yes, sir.

Judge: What is your opinion? Then you can state the reason for it.

A Well, it would vary, but I would say at least a half mile. And that's based on that a gunshot is a very loud sound. It's something you hear over a great distance. And a microphone is a very sensitive instrument. At times you can pick up stuff that even the ear misses, but it's probably,

in the range of sensitivity, it's about what you can hear. And a gunshot fired in the open would tend to travel at least a half a mile, sometimes you could hear it much farther away than that.

Q You also testified last week, Mr. Koenig, that in your opinion the first gunshot fired that day, shot number one, was probably subsonic..

Objection.

Objection.

Judge: No, that's alright. Go ahead.

Q ...Why did you use the word "probably" when you made that determination?

A This 'N' wave I talked about last week--it reflects whether a gunshot is supersonic or not. And if a gunshot lacks that 'N' wave, then--in controlled conditions where you can look at everything, you can say it is subsonic or it is supersonic. One of the problems you run into is that the 'N' wave travels kind of straight forward from the gun, so if the gun is pointed--if I fired in the opposite direction from you, you wouldn't see the 'N' wave, even though it exists. If I fired towards you, you would see it. So we get into a problem that, if I don't see an 'N' wave, oftentimes I can't be positive it doesn't exist. The other problem is, what if the bullet is just barely supersonic. Last week I talked about that, on that day, the speed of sound was 1,113 feet. What if the bullet traveled at 1,114 feet--well, it's actually supersonic; it's going faster than the speed of sound. But the 'N' wave (inaudible) not be visible. So many of these, I have to sit there and say it's probably subsonic. I found no evidence of it being supersonic.

Q What causes the 'N' wave, Mr. Koenig?

A The bullet itself produces a sonic boom, if you want to call it, kind of like a jet going overhead. This boom goes ahead. For instance, if I fired a bullet at Mr. Linsin, the attorney here, and I fired from here. The bullet would get to him, if it was supersonic, faster than the sound of the blast. Because the gunshot goes off and that wave that's produced by the gunshot being fired travels 1,113 feet per second. Well let's say the bullet he fired is going 3,000 feet per second. The bullet would get to him before the shot would be heard. And that difference, that bullet going through, produces this wave--this characteristic 'N' wave as it travels. So that wave gets to him as the bullet does. So he would see the 'N' wave first and then sometime thereafter the gunshot blast itself would arrive at his position.

Q At the conclusion of your testimony last week, Mr. Koenig, you had testified to the location of the first and second shots fired on November 3 and you had referred to Government's Exhibit D10, the large scene diagram that is now in front of the jury, and the overlay, Government Exhibit D10b to--as reflecting the location of those two shots. Ah, who placed those stickers with the small number one and number two on that overlay, Mr. Koenig?

Objection, again your honor, to the form of the question, using the term "shots fired" rather than "shots recorded" is testimony by the Attorney for the Government. All Mr. Koenig can testify to is shots that were recorded on the audio portion of the video tape that day. He cannot testify as to how many shots were fired.

Judge: I think the jury understands the question, go ahead.

Q Thank you, your honor.

A I put the stickers on the overlay.

Q And, did you use any particular reference point on this scene diagram in calculating the locations on the overlay?

A Yes, sir.

Q Would you tell us what that was, please?

A When I computed all these shots I had to have a reference point that anybody after me could come back and say here's where the points were. So I just used the, ah, southwest corner of the 1700 Carver building.

Judge: Where is that?

Q May the witness step down, your honor?

Judge Yes.

Q And, Mr. Koenig, would you point indicating on Government's Exhibit D10--point to the corner to which you just testified?

A It's this corner, right here. And it's just a reference point. In other words, I could have taken this corner here, this corner over here, I just used that as my reference point. It could have been any place on the map.

Q And how did you then calculate the locations of these shots, sir?

A Okey, like, for instance for shot number one, I would say, this is north. I would say it would be X amount of feet west and then X amount of feet south, or its on the exact point.

Q Now, did that reference point, other than using it as a method for calculating the location, did that particular corner of the building

have any other significance in the process of your analysis?

A No, sir.

Q And what effect would it have had, Mr. Koenig, if the placement of that--the corner of that building was off by some minor margin in measurement?

A It could easily be adjusted for each--each gunshot. For instance, if it was off six inches, I'd just move my measurements about six inches further then and correct for that.

Q Was this one of the factors you took into account in calculating your error rate, or your potential rate of error in the placement of these--these shots?

A Yes, sir.

Q Your honor, I would request that the jury be permitted to view a portion of the Channel 11 video at this time.

Judge: Very well.

Q ...that would be, ah, Exhibit VT1b. Mr. Koenig, did you--in your opinion, Agent Koenig, were any other gunshots fired from that location on November 3?

Objection.

Judge: Overruled.

A That was the only gunshot fired in that particular location.

Q Now, your honor, I would now request that this video tape be advanced, ah, for a few frames and then if we could switch to the Channel 8 video to illustrate one additional point.

Judge: Alright. (tape plays).



Q It is frozen--that was frozen at eleven minutes 49 seconds and one-thirtieth of a second. I would ask the witness to consider a portion of VT3b, the Channel 8 videotape, that has been admitted into evidence. Your honor, we certainly intend to show the jury the entire Channel 8 tape, I--I have requested this witness's attention to a specific portion of this tape for a very specific purpose, and I...

Judge: What--when do you propose to play the entire Channel 8 tape?

Q Yes, indeed, your honor.

Judge: When--when are you going to do that?

Q When we--we had intended to do that, your honor, prior to the conclusion of this witness's testimony.

Judge: Alright, you may proceed.

Q Thank you, your honor.

Judge: At least with this segment of it and we'll see what happens.

Q Thank you, your honor. Now we do not have a time counter on this Channel 8 video tape. I would just indicate for the record that in the frame at this point are--is a sedan in the foreground and a pickup truck in the background, the individual who is in the location of shot number one is still visible out of the side of the pickup, and there is another individual that's in the foreground to the left of the sedan. Now my question to you, as to this particular portion of the Channel 8 video Mr. Koenig, is as follows: Are the two individuals to whom I have just referred looking in the direction from which you concluded the second shot was fired on that day?

Objection to the leading.

Defense: Your honor, please, this leading is absolutely improper. Ah--he--Mr. Koenig can testify to these facts, and that's what the tape is being run for, I have no objection to that.

Judge: Alright. Alright, don't lead the witness. Rephrase the question.

Q Mr. Koenig, if you could step down to Government's Exhibit D10 with the overlay of D10b to again point out to the jury the location from --location where you concluded the second shot was fired on that day?

Defense: Object to the repetition.

Judge: No. That's a permissible question, go ahead.

A Gunshot number two occurred south of Vehicle 43, the south side of the street.

Q And viewing the frozen frame on the Channel 8 video, do you have an opinion as to the direction in which the two individuals are looking, sir?

Defense: Objection, your honor. The jury can view the video tape.

Judge: Well, no, I'll permit the question, go ahead.

A We're looking at--in this part of the video, actually, this is Channel 8 film that--you see that--where the number--first shot was fired here, this one man in the pickup truck, and the other man then right here. And here, shot number two occurred, and they both looked back over in this general direction. Of shot number two. So they respond and then shot number two goes off, they turn around and look at it.

Q ...on Government's Exhibit D10. Now asking you to refer to Government's Exhibit D10 and the overlay D10c. Mr. Koenig, were you able

to determine the location from which shot number three was fired?

A No, sir.

Q Were you able to determine the location from which shot number four was fired?

A No, sir.

Q And were you able to determine the location from which shot number five was fired?

A No, sir.

Q Were you able to determine who fired shot three, shot four or shot five?

A No, sir.

Q Why were you not able to make these determinations, Mr. Koenig?

A As I discussed earlier, I'm basing this on this echo analysis, the echos bounce off buildings and cars and anything else. Gunshots number three, four and five had so few echos, and such low amplitude, that I didn't feel I could make an accurate determination of where they were.

Q Now, Mr. Koenig, I'm going to ask you to consider the entire area as depicted in Government's Exhibit D10, and do you have an opinion, sir, as to where shots three, four and five could have been fired without producing the echo patterns which you just discussed?

A Yes, sir.

Q Would you take the pointers and describe, in some particularity, the locations from which those shots could have been fired without producing the echo (inaudible), sir?

A Yes, sir. What I'm really doing here is eliminating the area

where I know I would get echos. There's two major areas. One is this area right in here. This is right--north of the intersection of Everitt and Carver -- between the recreation and administration building, 1700 Carver building, this area right in here.

Q What would be the northern boundary of the area you're indicating now, Mr. Koenig--if you could make reference to a portion of one of the vehicles there, it might be of assistance.

A Well, it's not a regular line. It kind of V-shapes up, up in the area of the northern part of car--Vehicle number 16--a kind of a V-shaping area.

Q And so you're indicating the point of that V would be actually north of Vehicle 16, on the center--toward the center of Carver Drive, is that correct?

A Yes, sir.

Q And what would be the southern boundary of that area?

A Probably in the street itself down there, in Everitt Street.

Q You're indicating the--the center portion of Everitt Street, the street that is running east and west?

A Yes.

Q And would the east and west boundaries of this area be determined by the edges of the two buildings...

Defense: Object, please, your honor, let him show us.

Judge: Well, might let him show us.

A Okey, it's near the edge. It kind of varies by how far you get away from the edge. But it's--it's not a box. But it's fairly close to

that. (inaudible)...approximately edge...(inaudible).

Q And are there any other areas, sir, from which the shots could have been fired, shots three, four and five, without producing the echo pattern?

A The other major area, down beyond Vehicle number 42.

Q When you say beyond, are--would you make reference...

A West.

Q Alright.

A West of Vehicle 42. Because you reach a point where you're not getting many echos off this building and this building. And this area --(inaudible) vehicles wouldn't cause sufficient echos to be useable. So any of this area down west of 42 until you start getting down, ah, we'd have to go beyond Vehicle 48 (inaudible).

Q How--how far west, sir, if you can tell?

A It'd be--it'd be well west. Probably past even Vehicle 55.

Q Alright. And would you indicate, ah, what the shape of this particular area would be?

A Ah, this would roughly be a rectangle. Coming off of this area on both sides of the street, paralleling the street up and down. Again, it would have some irregularity to it.

Q The longer dimension of the rectangle being east-west or north-south?

A East-west.

Q Now, at this point, Mr. Koenig, I am going to cover up a portion of Government's Exhibit D10 and the overlay and for the purposes of the

record I am covering the portion which is to the west of Vehicle 43, the covered portion being on a north-south axis and everything to the west of the--of Vehicle 43, has been covered. Now, Mr. Koenig, for the next couple of questions, I'm going to ask you to consider only that area of D10 which is now exposed--that is everything to the east of Vehicle 43. If I were to ask you, Mr. Koenig, considering only that exposed portion of Government's Exhibit D10, what areas shots three, four and five could have been fired from without producing the echo patterns that you discussed, what would be your answer, sir?

A It was probably the area--it would be this area outlined previously--this area north of the intersection of Carver and Everitt. I've outlined by the borders of 1700 Carver building, the recreation administration building.

Q And what would be the north-south, ah, boundaries of that area?

A South would be the middle of the street here, Everitt Street, and the north would be--again, it's a kind of squared-off area with a kind of peak--just north of Vehicle 16 in the middle of the street--Carver Street.

Q Did you testify in a previous proceeding, Mr. Koenig, that, ah, you were ninety-nine percent certain that shots three, four and five were fired in the area that you just described?

Defense: Object to the leading, your honor.

Judge: I'll permit the question.

A Yes. Yes, sir.

Q And when you testified to that, Mr. Koenig, what area of the intersection of Everitt and Carver were you asked to consider?

A Approximately the area that's outlined here.

Q Would you be more specific?

A It's from--eastern boundary would be Vehicle 24, western boundary is Vehicle 43, south to the, ah, vehicles such as 46 and north to the northern edge of 1700 Carver.

Q And when you testified to that opinion, Mr. Koenig, had you been provided any information about anyone having fired additional shots further west of Vehicle 43?

Defense: Objection your honor. That's not part of the exhibit.

Defense: ...expertise. He said he didn't consider what people told him about where shots were fired from. This is just a scientific analysis.

Judge: (inaudible)

Prosecutor: Your honor, I'm just trying to determine what information he based his earlier testimony on. He's testified that he-he was considering only this area, and I'm just attempting to determine whether or not he had been provided any additional information, ah, when he rendered the earlier testimony.

Judge: I'll permit the question, go ahead.

A No, I had no basis for any shots, other than in this particular area upon--at least I was told that--I had done my evaluation...

Defense: Objection to what he was told.

Judge: I'll sustain the objection.

Q Alright. Now, I would now like to remove the cover to the western portion of Government's Exhibit D10 and ask you Mr. Koenig, considering the entire area of Government's D10, whether you still believe, and can be

ninety-nine percent certain that shots three, four and five were fired in the rectangular area that you described in the northern portion in the intersection of Everitt and Carver?

Defense: Objection, your honor. I think he's cross-examining his witness.

Judge: No, I'll permit the question.

A Ah, no sir. When I was limited to this area here, I felt that this was the overwhelming possibility it was in this area right around the intersection of Everitt and Carver. But again, this area down here could also produce gunshots that had no echo, so I had no way of knowing which of those areas the gunshots could have come from.

Q Alright sir. Just once--to make sure they're right in this area--when you say this area down in here, would you describe the area you're talking about, Mr. Koenig, for the record in reference to D10?

A Yes. Down west of at least Vehicle 42--41 and 42--and extending east-west right here probably to near Vehicle 55, and in the north-south direction, probably 15 or 20 feet into (inaudible) ...Everitt Street.

Q Alright sir. Mr. Koenig, were you able to determine the times at which shots three, four and five occurred?

A (inaudible).

Q Alright. And, with reference to Government's Exhibit D5, would you tell us what times those are, sir?

A On Channel 11, it would be at 11:54:28, 11:55:20 and 12:00:03.

Court Reporter: 12:01:03? Did you say?

Judge: Repeat that last time.



A Twelve, zero, zero, zero, three.

Q Your honor, I request the jury be permitted to view those--that portion of the Channel 11 tape at this time.

Judge: Alright. (tape plays).

Q ...time portion that's, ah, that ah, to which you have just testified, Mr. Koenig?

A Yes, sir.

Q ...able to determine the location from which shot number six was fired?

A Yes, sir.

Q With reference, sir, to the overlay we have now placed on Government's Exhibit D10, that overlay being D10d, would you indicate the place on which you concluded that shot number six was fired?

A Yes, sir. Shot number six was fired near the southeast corner of Vehicle 22.

Q And, just so we're clear, did you again place these stickers on this overlay, Mr. Koenig?

A Yes, sir, I did.

Q Did you place stickers on all of the overlays in terms of the placement of the 39 gunshots?

A Yes, sir, I did.

Q Were you able to determine the location for shot number seven?

A Yes, sir.

Q Where was that?

A Basically the same as this is--shot number six.

Q And shot number eight, were you able to determine the location for that shot?

A Again, approximately the same position. Near the southeast corner of Vehicle 22.

Q And did you determine the location for shot number nine?

A In the same--same position.

Q And did you determine the shot location for shot number ten?

A Yes, sir. The same position--in shots six through nine.

Q And did you determine the location for shot number eleven?

A Shot number eleven was slightly farther east of the position of shots six through ten, just north of Vehicle number ten.

Q Moving back to shot number six, Mr. Koenig, were you able to form an opinion as to the individual you saw on the video who fired shot number six?

A Yes, sir.

Q Mr. Koenig, I'm going to ask you to refer to Government's Exhibit D8 and ask if you see in any of these video stills contained on this exhibit, the individual that you concluded fired shot number six?

Defense: Objection, your honor. His expertise is magnetic tape analysis, not photogrammetry or photointerpretation, it's outside the scope of his expertise.

Judge: I'll permit it, and it's up to the jury to decide whether his, ah, identification (inaudible), they're the judges of the fact. Go ahead.

A Well, my description of individuals are not by name, 'cause I

don't know the individuals. But, I show that it was fired by a bearded white male in a white sweater or shirt with dark trousers. And the person matching that description would be--what is marked here as...

Q Would you simply read the name that appears beneath the, ah, photograph to which you are pointing?

A Roland Wayne Wood.

Q Were you able to determine, Mr. Koenig, who had fired shot number seven?

A No, sir.

Q Were you able to who had fired shot number eight?

A No, sir.

Q Were you able to determine who had fired shot number nine?

A Yes, sir. It was again picture....

Defense: Object again, if your honor please.

Judge: Alright. I'll permit the answer.

A Picked it as Roland Wayne Wood.

Q And as to shot number ten, were you able to identify, ah--were you able to determine who had fired shot number ten?

A Yes, sir. Again, Roland Wayne Wood.

Q As to shot number eleven, Mr. Koenig, were you able to determine who had fired that shot?

A Yes, sir.

Defense: Objection, again your honor.

Judge: I'll permit it. Go ahead.

Q Who did you determine had fired that shot?

A Is this picture of the person...

Defense: Objection.

Defense: Objection. The witness asking a question...

Judge: Sustained.

Q Please just look carefully at the photographs,...

A The individual here with the baseball cap, seen through the glass, ah, in this photo here marked David Matthews,...

Defense: Objection. Move to strike.

Judge: Overruled.

Q And again, which shot was that you were referring to?

A Gunshot number eleven.

Q Now, your honor, as to these shots, I would request the jury be permitted to view the relevant time frames of both Channel 11 and then Channel 2.

Judge: Very well.

Q ...portions of the Channel 11 video during which you concluded shots six through 11 were fired, Mr. Koenig?

A Yes, sir.

Q And those would include, again making reference to Government's D5 for purposes of the record, would you tell us what time code portions shots six through eleven were fired in?

A Number six was 12:11:14, number seven was 12:12:02, number eight was 12:12:14, number nine is 12:12:16, number ten is 12:13:15 and number eleven is 12:18:00.

Q Alright.

Defense: ...between the time counter on his machine here and the time code on the video. I don't think it's necessary to run up to a particular place on the tape; to go through this ear shattering stuff every time we have to do it. Either we should be able to low--to--you know, turn the volume down, or he can just use his chart and go up to the proper place on the time counter.

Prosecutor: Your honor, I--I would concur in Mr. Greeson's request.

Judge: Alright. Let's see if we can't get away from that.

Q Yes. (tape plays). ...we have frozen at 22:18:09 on Channel 2 and I would ask Mr. Brereton to proceed with the film in slow motion from here until 22:24:26. (tape plays) Now that portion which I just described Mr. Koenig for the purposes of the record, is that the, ah, time period on the Channel 2 video tape where you concluded shots six through eleven occurred?

A Yes, sir.

Q Mr. Koenig, with reference to shots twelve through nineteen, sir, I will not ask each one individually; but, ah, were you able to determine the locations from which shots twelve through nineteen were fired?

A Yes, sir. I did.

Q If you would step down and make reference to the next overlay we have placed on Government's Exhibit D10, it would be D10e, using the pointer would you explain to the court and the jury the location from which you concluded shots twelve through nineteen were fired?

A Yes sir. Gunshots number twelve, fourteen and sixteen, seventeen and eighteen came from an area just east of the 1700 Carver building. That

would be in front of the sidewalk here. Gunshots fifteen and nineteen occurred right down at the intersection here on the northeast corner of Everitt and Carver. Gunshot thirteen occurred between Vehicle 21 and 22.

Q Now, were you able to determine the identity of the person who fired gunshot number twelve?

A I determined the probable identity.

Q Yes sir. Alright. Will you--ah--describe--ah--what you saw that individual wearing?

A It was a white female wearing a yellow raincoat.

Q And as to shot number thirteen?

A Yes, sir. That was fired by a white male in a white sweater or shirt, previously identified as...

Q Ah, with reference to Government's Exhibit D8, would you indicate the video still that depicts that individual and read the name that appears beneath that video still?

A Roland Wayne Wood.

Q And, ah, were you able to determine the identity of the person who fired--fired shot number fourteen?

A It is probably a white female in a yellow raincoat.

Q And were you able to determine the identity of the person who shot vehicle number--ah--shot number fifteen?

A Yes, sir. It was fired by a white male in a blue jacket and trousers.

Q And were you able to be--to determine--ah, who fired shots sixteen, seventeen and eighteen?

A Yes, sir. Definitely fired by the white female in the yellow raincoat.

Q And were you able to determine the identity of the person who fired shot number nineteen?

A Yes, sir. It was fired by a white male in a blue jacket and trousers.

Q Now, with regard, sir, to shots fifteen and nineteen, I ask you, making reference to Government's Exhibit D8, to point out the individual, ah, still photograph that depicts the person you believe fired shots fifteen and nineteen and read the name that appears beneath that video still?

A Yes, sir. Jerry Paul Smith.

Q Now, with regard to, ah, shots fifteen and nineteen, Mr. Koenig, did you obtain echo patterns in connection with those two shots that permitted you to locate where those shots had been fired from?

A No, sir.

Q How were you able to place shots fifteen and nineteen?

A You actually see the shots being fired on the video tape. And the only thing you have to worry about when you look at something just visually is, how far back or how close they are; and it's very difficult to tell. In those pictures, I could actually see the person's feet on the sidewalk, and actually could see him firing. And additionally, it was in an area where there were--(inaudible) our sound wave had to (inaudible), just like we expect.

Q Were you able to obtain echos from the--shot thirteen, which

you indicated occurred between Vehicles 21 and 22?

A Yes, sir.

Q At this time, your honor, I would request the jury be permitted to view portions of the Channel 11 video and I would ask that it simply be run in slow instead of doing both, and request that Mr. Koenig indicate on the, ah, frame, the white female that he was--he had concluded fired shots twelve, fourteen, sixteen, seventeen and eighteen.

Judge: Very well.

Q ....twelve, nineteen, twenty-four and you will continue through twelve, twenty-two, fourteen and Mr. Koenig when you see the individual --the white female that you had discussed earlier, would you just indicate that to Mr. Brereton and we will freeze the frame there and you would--point that individual out, if you would, to the members of the jury. Okey. We have frozen at 12:21:06, and would you describe, Mr. Koenig, again so the record is clear, where on the frame the individual appears that you concluded fired shots twelve, fourteen, sixteen, seventeen and eighteen?

A Yes, sir. This is Vehicle 19, right past (Hillbee?), right at (Hillbee?) back in the shadows to the west of 1700 Carver. We see the individual back there firing. See the yellow raincoat there.

Q If we could advance the film forward...? Mr. Koenig, we have now frozen at 12:22:14. Can you tell us which shot you concluded occurred at this time on the Channel 11 video tape?

A Gunshot number eighteen.

Q Were you able to determine the location from which shots twenty



through twenty-four, or locate guns I should say, from which shots twenty through twenty-four were fired?

A Yes, sir.

Q Making reference now to the overlay covering D10, which would be D10f. Would you point out to the court and to the members of the jury where you concluded shots twenty through twenty-four were fired?

A Gunshot number twenty was fired near the northeast corner of Vehicle 9, twenty-two and twenty-three are somewhat off the southwest corner of Vehicle 9, gunshots twenty-one and twenty-two are just east of the far west end of the recreation administrative building.

Q Now, with reference to shots twenty and twenty-one, Mr. Koenig, were you able to determine who had fired either of those shots?

A No, sir. I could not determine.

Q Were you able to determine who fired shot twenty-two?

A Yes, sir. It was a tall white male with shoulder length hair and blue jean outfit.

Q Making reference, Mr. Koenig, to Government's Exhibit D8, I would ask you to examine these video stills and point out the individual to whom you have just referred?

A Well, there's several pictures of them here. This one, I presume, the man to the left side of the Jack Fowler picture.

Q Alright. You're--you're indicating the picture that is above the name Jack Fowler?

A Yes, sir.

Q And does the physical appearance of the man in that video still

agree with the physical appearance of the man you concluded fired, ah, that shot?

A Yes, sir. Probably fired that shot.

Q Okey. And were you able to conclude who fired shot number 23?

A Yes, sir. Again, it was a picture depicting Jack Fowler.

Q Now, with regard to shots twenty-two and twenty-three, Mr. Koenig, does your analysis indicate anything distinctive as to those two particular shots?

A Yes, sir. Those two shots illustrated very graphically the 'N' waves of a supersonic boom I referred to earlier. These gunshots were fired at approximately 3,200 feet per second. Almost three times the speed of sound. And the 'N' waves preceding them were very definite, very obvious, very unique--very unique. It was the highest velocity ballistics fired at the scene on that day.

Q Now, perhaps--I'm not certain we made this--I posed this question to you at the beginning, Mr. Koenig, but in your analysis of whether a particular shot is subsonic or supersonic or possibly subsonic, does that conclusion bear any relation to the type of weapon that fired that particular shot?

A To some extent.

Q Could you describe, please?

A Alright. Well, looking at this 'N' wave, this supersonic bullet --projectile--it's more important that you have a bullet that's capable of doing that. In other words, you can take a magnum weapon made to shoot the supersonic, or a rifle, and shoot subsonic ammunition. And you also

could take a weapon made for subsonic, even though it would be abusing the weapon, you could put supersonic ammunition in it and it could fire that. You see, the ammunition is more important than the weapon. Most weapons can fire some type of supersonic projectile. And a supersonic weapon can also fire subsonic.

Q Okey, Mr. Koenig. Moving on to shot twenty-four, were you able to determine the identity of the person who fired shot number twenty-four?

A Yes, sir. There was (inaudible).

Q Was there any visual information that assisted in your --any visual information as to shots twenty-one or shot twenty?

A Not sufficient to determine who fired them.

Q Your honor, I would now ask that these portions of the Channel 11 video. I would request that the jury view from 12:23:26 to 12:28:25. (tape plays). ...ask you--I make reference to overlay D10g which has now been placed over Government's Exhibit D10, and ask if you were able to determine the locations from which shots twenty-five through twenty-eight were fired?

A Yes, sir.

Q Would you explain to the court and the members of the jury where you concluded those shots were fired from?

A Gunshots 25 and 28 were near the southeast corner of Vehicle 20. Gunshots 26 and 27 were (ia) along the southwest corner of Vehicle 9.

Q Now were you able to determine the person who fired shot number twenty-five?

A Ah, probable determination.

Q Now could you explain, first of all, with reference to Government' D8, the individual that you concluded probably fired shot 25 and then I will remove this and ask if you could explain how you made that conclusion?

Defense: Objection

Judge: I'll permit it, go ahead. Overruled.

A The picture with the name Roy Toney, he's seen here--you see the red flannel shirt (inaudible).

Q Now how were you able to reach the probable conclusion that, ah, that individual had fired shot number twenty-five.?

A Soon after the gunshot, he is seen at that location, and time is so short. The probability of anyone else being there that quickly is very small.

Q And with reference to shots 26 and 27, did you make a determination as to who had fired those two shots?

A Yes, sir.

Q And what was that determination?

A I determined a tall white male with shoulder length hair and blue jean outfit fired both those shots.

Q With reference to D8, would you indicate the video still that depicts that individual and read the name beneath it?

A Jack Fowler.

Q And he is the person--which of the persons depicted in that video still?

A He's in the blue jean outfit and you can see the shoulder length (ia).

Q With regard, Mr. Koenig, to shots twenty-six and twenty-seven, did those two shots produce any distinctive wave patterns?

A Yes, sir.

Q What were they?

A Again, it was from the same probable individual who fired two previous shots that were highly supersonic, traveled about 3200 feet per second. Very much the 'N' wave characteristic of the supersonic ammunition he used.

Q And you say those characteristics appeared in connection with shots 26 and 27?

A Yes sir.

Q Now, Mr. Koenig, you've indicated that characteristic here--that 'N' wave--clear 'N' wave characteristic--appeared in connection with shots 22, 23, 26 and 27?

A Yes, sir.

Q Did you obtain such a clear 'N' wave characteristic in connection with any other of the 39 shots fired that day?

A No, sir.

Q With regard to shot number 28, Mr. Koenig, making reference to Government's D8, would you point out--were you able to make a determination as to who had fired that shot?

A Yes, sir.

Q With reference to Government's D8, would you indicate the individual you concluded fired shot number 28?

Defense: Objection.

Judge: Overruled. Go ahead.

A Probably fired by Roy Toney.

Q Your honor, at this time I would like the jury to view--request the jury to view this portion of the Channel 11 video.

Judge: Very well.

Q And, for the record, I am requesting the jury to view from 12:30:05 to 12:31:17 on the Channel 11 video.

Defense: So's not to belabor the point any more, your honor, can I have a standing objection to the use by the prosecutor of the term "number of shots fired that day", just to make the record that I object to the use of that term?

Judge: Yes. Alright, sir. The record will reflect your objection, and the objection is made on behalf of all parties here.

Defense: Thank you, sir.

Judge: Very well. Bring the jury in.

Q Your honor, at this time we would ask that the jury be permitted to view a portion of the Channel 8 video tape for purposes of illustrating this witness's testimony with regard to the identity of the individual who fired shots 25 and 28. I will ask that this film be run at slow speed and ask Mr. Koenig to step down to the video monitor and to indicate where he sees this individual in the video, and describe the movements that he referred to earlier.

Judge: Very well.

Q ...see an individual slumping in the background and two individuals visible to the right of the screen, Mr. Koenig could you, ah...

Defense: Your honor, let me object once again to Mr. Linsin testifying. It would have been very easy to ask Mr. Koenig if this appeared to be the same place. I object very strongly to his leading him.

Prosecutor: Well, Mr. Greeson, if it's not the same place, Mr. Koenig can tell us that. I'm simply telling him to describe for the record what is visible on the video screen.

Judge: Alright. I--I think it's a proper question, go ahead.

Q Would you indicate the individual, if you can Agent Koenig, that you concluded fired shots 25 and 28?

Defense: Objection to the word "concluded".

Judge: Overruled. Go ahead.

A The individual who probably fired 25 and 28 is this individual who--reddish shirt and blue jeans.

Defense: Your honor, I object to a probable identification. Either there is an identification or there is not. And he's used the term "probably" in ...

Judge: Well, you can cross examine him on that. That goes to the weight that--the advantage--the jury can give his testimony. (tape plays)

Witness: ...if I may correct that. I meant probably on 28 and it was fired on 25.

Q And why do you make that distinction, Mr. Koenig?

A Twenty-five, I'm positive that's who fired it. Twenty-eight, it's (ia) probability.

Q Why--why do you have those different--those two different opinions as to those two different shots, Mr. Koenig?

A I make it a probably when I think there's absolutely any chance whatsoever that someone else could have been in that location and fired. And a positive that (ia) ...directly seeing him fire or seeing the person standing there with no one else around for (ia) seconds...realize that somebody couldn't move that quickly...(ia) definitely it takes three seconds or four seconds (ia) some chance someone else could have been there. Very small probability, but a possibility.

Q What did you conclude, Mr. Koenig, was the difference in time between shots 25 and 28?

A The total difference between the shots?

Q The difference in time, yes.

A One point--approximately one point four seconds.

Q Okey. Were you able to make a determination as to the location--locations from which shots 29 through 35 were fired?

A Yes, sir.

Q I ask you to step down and making reference to the overlay now covering D10 which is D10h, would you indicate to the court and members of the jury where you concluded shots 29 through 35 were fired from?

A Yes, sir. Gunshots 29, 30, 32 and 34 were all fired just east of the recreation administration building. Gunshots 31, 33 and 35 were fired just north of Vehicle number 10.

Q And what is the time differential--the time period, Mr. Koenig, between the time shot 29 and shot--the point shot 35 were fired?

A Approximately thirteen--approximately thirteen and a half seconds.

Q Were you able, Agent Koenig, to make a determination as to who



had fired any of the shots 29 through 35?

A Gunshot 31, I see an individual on the right side of Vehicle 10...

Defense: Objection, your honor. The question was whether he could identify or not. He hasn't been responsive to that.

Judge: Well, can you identify that person?

A It's kind of hard to answer the question that way, your honor.

Judge: Well, you can answer it and then explain it.

A Oh. I couldn't identify it in the sense that I could say that individual was some other place in the tape. But you could see an individual firing gunshot 31. I just couldn't get enough descriptive data to say I could identify him some other place but in that picture. But you can see someone firing in that shot.

Q At this time, your honor, I would request the jury be permitted to view that portion of the Channel 11 videotape which is within the time frame of 12:31:28 through 12:45:06. (tape plays). Would you indicate on the video, Mr. Koenig, when you see the person firing shot 31 that you discussed a moment ago?

A We passed that point.

Q Okey. For the record, we have frozen 12:33:27. Do you see that individual on this portion of the videotape?

A It's very difficult to see. If you watch it over a period of time--right before, right after--you see the movement right through the front van window; the van door was (???) open and you could see movement back there. So you definitely can place, like I said, some information there, of what looks like a gunshot occurring.

Defense: Objection, your honor, to what looks like a gunshot occurring.

Judge: Well, he's the expert, he's pointing...

Defense: I know, he's pointing to a place on the window, he hasn't identified anything.

Q Well, what--what is it you see on the video portion of the video tape, Mr. Koenig, that leads you to believe that a gunshot is occurring back there?

A You see an indication, after watching it repeatedly, what looks like a muzzle blast--smoke from a muzzle blast. It's very slight.

Defense: Well, point it out to the jury, where...

A Well, it was right through this window, and that's where you're going to see it. You just see some movement back there. We had to watch it repeatedly. But again, no information can be seen about the individual doing it.

Defense: Objection, your honor. Move to strike this entire line of testimony.

Judge: Well, I think....wait a minute, I think you should come to (ia) and show the jury what you're talking about...

Prosecutor: Let's back up just slightly here. Okey. Alright, going very slowly forward, if we can, Mr. Koenig from 12:33:15 forward with the film moving very slowly, would you point out to the members of the jury and the court, ah, what it is you are describing?

A Okey, you can see the little white area there, and you can see it moving. There's a person back there if you watch it very careful. When it comes up here, we see--in fact right then--what we perceive could be

smoke from the blast. Okey, prove it. But we see indications of it. Now the echo analysis put the individual there and we know the gunshot could have been. Trying to visualize exactly what we're seeing there.

Defense: Your honor, I object (ia).

Judge: Well it's up to the jury, they've seen it, and they either accept Mr. Koenig's testimony or not. They--you're the judges of the facts, ladies and gentlemen. (tape plays)

Q Does that portion of the video that we have just viewed, we have now frozen again at 12:45:07, contain the shots you concluded were the--were shots 29 through 35, Mr. Koenig?

A Yes, sir.

Q Alright. ...reach a conclusions as to the location from which shots 36 through 39 were fired?

A Yes, sir.

Q Ah, with reference to overlay D10i, which is now covering Exhibit D10, would you indicate to the jury the location from which those shots were fired?

A Gunshots number 36 and 37 are just east of the recreation administrative building. Gunshot 39 is just north of Vehicle number 10. And gunshot number 38 is just southwest corner--the southwest corner of Vehicle 29.

Q Were you able to make a determination as to the identity of any of the persons that fired those shots?

A No, sir.

Q With regard to shot number 38, did you obtain echo patterns

which permitted you to locate that shot?

A No, sir.

Q How is it, Mr. Koenig, you were able to locate shot number 38?

A Gunshot number 38 was fired so close to the camera microphone positions which was just on the other side of Vehicle 29--just east of it--that it just distorted the sound into the microphone, because the gunshot sound was just so loud. So we ended up just getting a microphone distortion--like--that the gunshot had to be very close to that position.

Q At this point, your honor, I request the jury be permitted to view that portion of Channel 11 that contains these four gunshots, for the record that is, ah, from 12:51:23 through 12:56:23 on the Channel 11 video tape.

Judge: Alright. (tape plays)

Q Is that the portion of the Channel 11 vido tape that contains shots 36 through 39 Mr. Koenig?

A Yes, sir.

Q Mr. Koenig, the overlays that we have discussed both Friday and today, which would be overlays D10b, and D10i, inclusive, do those overlays accurately reflect the locations from which the shots you were able to locate were fired on November 3?

A Yes, sir.

Q And would the only exceptions to those be shots 3, 4 and 5?

A Yes, sir.

Q Mr. Koenig, if I could ask you again to step down, sir, and referring to overlay D10j which is now covering Government's Exhibit D10,

and ask you to describe what is displayed in that overlay sir?

A This is the summary of all the other overlays, listing all the gunshots I located.

Q Does it fairly accurately depict the locations at which you concluded shots 1, 2 and 6 through 39 were fired from?

A Yes, sir.

Q Did you place the stickers on this overlay as well, sir?

A Yes, sir.

Q At this time, your honor, I would request that the jury be permitted to view the entire Channel 8 video tape, and thereafter I will request that the jury be permitted to view the sequence of--on the Channel 11 video tape containing all of the 39 shots. (tape plays) Now, your honor, I would like to begin the Channel 11 video tape at a point prior to the time Mr. Koenig concluded the first shot was fired and after viewing this through the 39 shots I would have one question to pose to Mr. Koenig concerning this particular portion of the tape that we are about to view.

Judge: Very well.

Prosecutor: For the record, ah, we started a couple of moments earlier, but the portion I will ask you about, Mr. Koenig, is from 10:11:15 up until a point after the 39th shot was fired and I will indicate that time for the record once we get there. (tape plays)

Q Okey, we have now frozen the Channel 11 video tape at 13:05:21 and my question, Mr. Koenig, is this: if there had been some break or some interruption in the recording equipment that was used by the

Channel 11 camera crew on that date, between the time 10:11:15 and 13:05:21, would you have detected that interruption in the course of your analysis?

A We only analyzed back, like, a point back at 10:11, but back to around 10:24, when you first see the cars in the street, from that point on to the end at 13:05:21 there were no breaks.

Q And how can you determine that there were no breaks in the recording equipment?

A One of the examinations I do all the time is called an authenticity examination. Determining whether the tape's been altered or not. It's quite complex, but one of the things you look at is the wave forms that you look at in the gunshots. These are the same wave forms you look at to determine if the tape has been altered. And in video tapes they're very obvious, they're a lot easier to do than audio tapes. Audio tapes are a lot easier to alter. These video tapes are much more difficult. They tend to not--visually changing them is very obvious. And no matter what you do in the way of splicing is very difficult to cover that up. So it would have been very obvious to me, this detailed examination we did in this case, if there was any erasing at all.

Q So do you have an opinion, Agent Koenig, as to whether there was any interruption in the recording equipment between the two times that you stated?

A Yes, sir, I have an opinion.

Q And what is that opinion, Agent Koenig?

A There absolutely are no breaks.

Q With the court's indulgence at this point, we would request permission to move the large scale model into the--(ia) courtroom. I again ask you to step down, I ask you to view what has been admitted into evidence as Government's D12. I ask you if you have seen that before, Mr. Koenig?

A Yes, sir.

Q And on what occasion did you--what occasion did you have to view Government's Exhibit D12 prior to today?

A I (ia) to see it when I put the stickers on (ia).

Q And what did you do, if anything, in connection with Government's D12?

A I also put stickers on this Exhibit.

Q Which shot stickers did you place on Government's Exhibit D12 Mr. Koenig?

A Not all of them. One and two is not on here--believe it's 38...

Q I ask you, sir, to--if necessary, or if it would be of assistance to refer to D10 and the overlay presently covering D10 which is D10j, just state which of the shots you did not place--which of the shots you were able to locate, you did not place on Government's D12?

A I placed all the gunshots except one, two, thirty-eight, that's it.

Q At this time, your honor, I would request permission for the witness to remove the labels that cover these shot stickers.

Defense: Once again, we object strenuously to removing things

instead of putting things on, if your honor please.

Judge:     Alright.   Your objection's noted.

Q     Mr. Koenig, would you remove those pieces of tape and paper covering up the shot placements as you had found them to be?   Okey, now, Agent Koenig, tell us again did you place these sticker on D12?

A     Yes, sir.

Q     Did you locate shots 3, 4 and 5 on D12?

A     No, sir.

Q     And you indicated that shots 1, 2 and 38 were also not indicated on D12.   Does D12, as it presently stands, accurately locate --accurately depict--the location of shots 6 through 37 and shot 39, as you found those locations to be?

A     Yes, sir.

Q     With the court's indulgence, at this point I would request permission for the--any member of the jury that may wish to--be permitted to view this exhibit.   We have no further questions of this witness on direct examination.

Judge:     Would any members of the jury like to step forward and look more closely at the model, if you wish to you may do so.

Prosecutor:     Your honor, we are--we have no more question--questions of the witness.   At this point, the United States would move into evidence, ah, overlays D10b through D10j.

Defense:     We would object to those your honor, on the reasons previously stated for, ah, the other Government Exhibits that are pre--ah, (preperfect?).

Judge:     Yes.   Over Defense objection...



Prosecutor: I believe we have another--objection...

Judge: As...

Defense: Your honor, I also object to the admission for any reason other than to illustrate the testimony of Agent Koenig, and ask the jury to be instructed about the use for illustrative purposes.

Judge: Yes. These exhibits portray the expert opinion of the witness; and again the testimony of this expert can be accepted or rejected by you, based on whether you believe that his opinion is--has a firm foundation in fact. And these exhibits is demon--what we call demonstrative exhibits are admitted to demonstrate his testimony, you can either accept them or reject them. You understand that? Alright. Any other objections to these exhibits? Well, over the objections stated on the record by Counsel previously, these Exhibits D10b through D10j will be received into evidence.

Prosecutor: Thank you, your honor.

Judge: Yes. Now, it's almost time for lunch. Why don't we adjourn at this time, ah...

Defense: Your honor, may I ask for a few minutes more at lunch break today just to (ia) ...matter to take care of that I anticipate might take a little longer than...

Judge: How much time--how much time do you want?

Defense: I'd like to have an hour and a half, your honor, but if that's too much, I'll--

Judge: Why don't we make it--let's see, it's twenty after twelve-- why don't we come back--have the jury come back at a quarter to two?

--end of Tape #16--

--end of Koenig Direct--

Tape #17 - Cross Examination of Agent Bruce Koenig (beginning).

(Argument between Prosecution and Defense regarding the characterization of gunshots as being "Communist" and/or "Klansman".) Judge rules that certain shots can be referred to as "Communist Workers Party" shots to continue in the same manner as previously established when they were referred to as "Klansman" gunshots.

--Cross examination begins--

Mr. Greeson: Your honor, I have asked for one of the exhibits to be brought into the courtroom, previously introduced by the Government, and it's on the way now. I think I can go ahead and ask a couple more questions before it gets here.

Q Mr. Koenig, did you bring any visicorter graphs with you?

A No, sir.

Q You don't have any in the City of Winston-Salèm or anywhere nearby?

A No, sir.

Q So there's no--no way that we're going to be able to show the jury what one of these transient sounds--ah--when reduced by the visicorter looks like, is there?

A Other than the one chart I brought that would show what it looked like.

Q Alright, sir, you're referring to Government Exhibit D24, are you not?

A Yes, sir.

Q And you're referring to this part right here that you say shows something about--ah--what a sound wave looks like...when recorded?

A That's correct.

Q Now in actuality, the transients that you looked at on each of these shots that you testified to are quite a bit different looking from this simple--ah--drawing here?

A Well, they're more complicated because there's more echos.

Q Did you make this chart by the way?

A Well, I sketched that and an artist rendered it.

Q Mr. Ford, could you help me here a second to lift this down-- on the floor? Mr. Koenig, if you would, I'll ask you to come over to this location. Alright, now, the first thing I want you to do--let me interrupt just to get this one little job done--this is--ah--Government Exhibit D21. Right here--if you'd just step over here. I have prepared this--ah--ruler of sorts and I want you to compare it to the ruler that appears on Mr. Richards' drawing there and confirm that my lines are approximately right on that measuring stick. It isn't real fancy.

A Approximately, yes.

Q Alright sir. That could be used then on this--ah--map as well as on the other map which is the same as Mr. Richards' scale, is that correct?

A If the map's the same scale, that's correct.

Prosecutor: Your honor, could Counsel for the Government see the ruler, ah, Mr. Greeson's referring to?

Mr. Greeson: Sure. Here, you can hold onto it while I'm asking questions. If you would, take this magic marker and draw for the jury a transient, so they'll have an idea about what one looks like?

A A single transient?

Q Yes, you can pick any--do you--do you recall what some of them looked--looked like, right off your--I mean, all this is is a replica, it doesn't have to be exact or anything. I want them to see what a transient looks like and I want you to be able to demonstrate to them how you found the echo in a transient; so, of course, you'd have to use one that has an--an echo. How can--how about number one, do you recall that--what that looks like?

A I--it's a very complicated (ia). I could write it for an example.

Q Just do an example then. No specific shot.

A I'm going downhill a little bit, but that...

Q Yes, but--it would be straight if it was on the paper?

A Yes.

Q Now, can you give us a replica out here of exactly what the time code looked like, that you had engrafted onto the second channel?  
?? Your honor, may I have this moved so these lady jurors can see, I think they...

Judge: Why, yes, alright.

Mr. Greeson: Your honor, can you see?

Judge: Yes. That's fine. Can all the jurors see it?

A Well, the time code that was put on there is also extremely complex. Basically, you've got to have a sign where your components over here look kind of...I can't draw a (time?) wave. Like I said, it is very tight for high resolution.

Q And this just runs right along the whole length of this long piece of paper?

A Yes, sir, they do. (ia)

Q Now, if you would, explain what you have. What you've drawn here. What is this peak--is that called a peak?

A We call it a peak (ia).

Q Tell the jury, if you would, what that represents?

A That's the gunshot. The actual gunshot blast.

Q Is it possible for you, now, to draw a replica of a 'N' wave, so that we see what that looks like?

A Again, (ia).

Court Reporter: I'm sorry I can't hear...

Judge: Yes. Keep your voice up, please.

A Again, I drew it as best I could. It's kind of a complicated wave form.

Q Okey. It looks very much like this one you drew, did you mean for it to?

A It doesn't look exactly--I mean, to me it looks very different, but it certainly has a transient characteristic.

Q Now is the 'N' wave separated by some sp--actually, if I could have that a minute--if this was running along there would be some chatter, or noise, in the line off of it. You don't get a straight line, you get some irregularity maybe?

A It's very minor.

Q Right, minor. Would you have a blank space in between the

'N' wave and the muzzle blast?

A It--it varies. Sometimes, if you have gunshots...

?? Excuse me, we still have some jurors who can't see over here, could we move this thing out of the way?

Judge: Yes. Alright.

A It would vary. This distance here--would vary by how supersonic the gunshot was. If, for instance, it was 3000 feet per second, three times the speed of sound, approximately, this would be wide. If it was barely greater than the speed of sound, then it would be, you know, right up here, coming on right--right even with the (turning?).

Q Okey. So the--the slower the shot, even though it's supersonic, the closer it gets to a regular muzzle blast. Alright, sir, now you have come down here and I assume that's an echo, is that correct?

A Yes, sir.

Q Now, if you would, show the jury how you use your time code and your--ah--graph here to measure time. Then I'm going to ask you to convert the time to figures, if you can.

A The time code is normally used just to tell you what time it is. If you had a tape recorder with a time code it would just read the time (ia) above the tape recorder; so many seconds, minutes, hours, days--whatever the particular time code is. For convenience of accuracy, we put a time code along with recorded and audio information to allow us to go back and very accurately know what the time was. Not in the sense of real time of what day it is, but in comparison between various gunshots.

And this time code has basically a one thousand cycle sine-wave on it, plus additional information which increases the resolution which allows you to easily get into a, like, one ten-thousandths of a second resolution. It's a standard--the time code we use is called an (I-RAC V?), and it's a real--probably the most (ia) time code that's available. It was used simply to be able to measure from here to here, and from here to the next gunshot very accurately. It's a very common (ia).

Q     Alright, sir. Now, did you actually take a straight edge in order to get from the peak up to the time code--in other words did you just eyeball it or...

A     We used something to get very parallel with the edge of the paper. A T-square type.

Q     So you took it off the edge of the paper?

A     Yes.

Q     You assumed the paper was straight?

A     Yes. Yes. The paper is straight. You see. So then we can put the T-square right on up and know that directly opposite the peak and where it is on here, and we mark it there, and (ia).

Q     Alright, sir. Then how do you measure from here to here after you established that this echo occurs here and this--ah--muzzle blast occurs here?

A     We actually read the time code directly off of the sine-wave.

Q     Well--act--the time code doesn't have any numbers on it, it just has symbols, is that right?

A     Symbols? No, it's another wave form.

Q It's another wave form. But you have to count those--the peaks in between to get....

A Well, if--you can learn shorthand, you can read time code. It has certain little glitches in it that imply--that that's a seconds time and if you have to go long distances, you measure it out a little quicker than that. For short distances, like echos, we did just what you alluded to, we actually count how (ia).

Q Alright, was the second wave that came in always a lower peak?

A No...

Q ...than the first echo? I mean--did I say echo? The second echo always a lower peak than the first echo?

A No.

Q How can you account for that?

A Depends on what it is bouncing off of. In other words, if it goes off the side of a building, the echo's going to be louder than if it goes off, for instance, the windshield of a car.

Q Alright, sir. Did you use some echos off of car windshields in applying some of your--some of your locations?

A Well, parts of cars, their windshields or whatever we could find, a flat area that would allow this angle of (ia) ...echo to bounce off so it (ia) the camera (ia) position. Yes, sir.

Q Like the back of a Honda is more flattened than perhaps some other car and would be more useable than...

A We had to take it car by car to see if we got an echo off of it.



Q And depending on what kind of car it was, you then determined whether or not you wanted to use it?

A That's correct. We had to see if there was anything there we could get an echo off at that angle.

Q Now, let's assume that this is, ah--(ia) pencil for a second--(ia)--well, let's see. How far down the road was number one, 192 feet from the corner of (ia) apartments.

A It could be, I'd have to look at my notes.

Q Well--approximately. Say 200 feet. How many tenths of a second would it take for the echo to get back--or, excuse me--for the initial muzzle blast to get to the microphone if it was 200 feet away?

A It would be 200 feet over the speed of sound...I don't have a calculator with me.

Q Can you use mine?

A In other words it would equal point 1797 seconds.

Q Point 1797 seconds?

A Yes, sir.

Q Alright, sir. Now how do you convert that to the number of feet that the muzzle blast traveled?

A You just told me that, it was...

Q Oh, I'm sorry. We started at the wrong end. All I was saying was, for a 200 foot muzzle blast, if you were going to end up saying it was 200 feet in a straight line away from you, you would have had a time code reading of one--of point 1797 seconds?

A (ia).

Q     Alright, sir.  The second echo--I mean the first echo, then--  
ah, now wait a minute, what you just measured is from the initial muzzle  
blast to the first echo...

A     (ia).

Q     ...and you found that to be point 1797 seconds.  Did that  
give you the muzzle blast?

A     I don't...(ia).

Q     I'm sorry.  Did that give you the distance the muzzle blast  
was away from the microphone, if I measured that?

A     No.

Q     How did you determine the dis--the original distance of the  
muz--muzzle blast, is what I'm getting at.

A     We didn't--you can't compute that directly.  Because what  
happens is, the gunshot is here.  In actuality it occurred in time  
over here.  And to--if it went two hundred feet it would have to go  
point 1797 seconds before we saw anything on the recording.  So you  
couldn't, from a wave form say it had to be two hundred feet away.  
You'd have to use that echo analysis to determine where everything was  
located.

Q     Okey.  This is almost two-tenths of a second.

A     Yes.

Q     And--ah--it--it--the speed of sound on that thing, it would  
take approximately two-tenths of a second for an echo, I mean for a  
muzzle blast to reach the microphone?

A     If it was about two hundred feet...

Q ...If it was two hundred feet away. Alright sir, now what would you find in the way of an echo? How would you measure the first echo?

A Well, you start with measuring everything from the--again, the 'N' wave causes other problems, because it also causes some echos. But again, they're repititious using the gunshot (ia). ...(ia) we go to the first one, we measure that distance, we measure the second distance, we measure the third distance. And from that, you--I related it this way. I mean, what if we didn't know this distance. Then, we could do distance would equal, you know, the time up there we measured correctly times the speed of sound, 1113 feet.

Q Okey. So this reading multiplied by 1113, the speed of sound, gives you the distance?

A Correct. If the time was one second, it would be 1113 feet.

Q Alright, sir. I'll show you what's been marked, or what will soon be marked as (ia) exhibit number one. And it has a plastic overlay over it which we will mark as Defendant's Exhibit Number 2 for identification purposes. I want to ask you first of all if you recognize what this represents?

A This is a one inch to five feet scale model I believe of the Everitt and Carver intersection.

Q Right. And we just agreed that this ruler that we have over here is accurate with this ruler that's attached to it. This is the chart that Mr. Richards, ah, drew or testified to the other day that he created from his photomatrix, is that right?

A I didn't hear his testimony.

Q At any rate, you recognize it as being a chart of the intersection?

A That's correct.

Q Now, if you would, let me swipe your grease pencil for--magic marker--. Make a circle if you would where shot number one was, or approximately. We know this is not exact, your other charts have been exact. And could you just blacken in so we can make sure we see it--blue it in. Would you put another mark, a blue mark if you would at the point where you determined the cameraman was at the time of shot number one.

A I just put it down, but I know exactly where it was. We matched it up so it would fit. Approximately in this area.

Q Just approximately, is all we need. I just want you to illustrate how you--how you did this. Alright, sir. Now, you ran the audio tape--you ran the audio tape through your visicorter, you came out with a time code that you just illustrated and the visual representation of this gunshot?

A Correct.

Q Now, I know that you don't recall everything exactly, but I recall your testimony that you had a little trouble with this bus here, and you knew that if a shot was here and your cameraman was approximately here, that you ought to get a good angle off of this building?

A That's correct.

Q And you weren't getting it, and so you realized the bus was

in the way and par--partially, what--making it not as noticeable--what was your word?

A I don't remember my exact word, but it certainly blunted the transient...

Q Blunted. Alright sir. But you were finally able to get an echo that you say came off this building?

A Correct.

Q Now, I know once again that it would take too long with a protractor, but if you would, draw an angle approximately like the one that you used off of that building? Alright, sir, now the echo that you got from the visicorter, the information that you got, was the total number of feet. Let's say once again that this example we used was a record of shot number one and you got the figure two hundred--two hundred feet. That's two hundred feet, the whole length of that angle, is that right, if you found an echo that was two hundred feet--took 17 seconds to get there?

A That'd be point 17 seconds...

Q Point 17 seconds to get there?

A Not--not for total. You'd have to subtract this distance here.

Q Alright, explain that to me?

A Okey. Let's say this distance is a hundred feet. Go from here to here, so the gunshot--from where it occurred to the microphone--is a hundred feet.

Q Alright, sir.

A Let's say this echo, from going here to here is two hundred

feet. Then the echo would appear one hundred feet in time after the original gunshot was. Which would be something like point zero eight seconds.

Q Alright. Now, you didn't know what this angle was, or the exact point at which it bounced off the building, did you?

A Well, we knew that this angle here and this angle right over here had (ia).

Q Right.

A So, when we first started out we just had to, again, use a lot of just trying various spots.

Q Did you have two straight edges that you actually got up on the map and angled around to...?

A We had some precision rulers we used. We'd go there and there and we'd have to protract it here. And we moved the ruler where we thought they were and then get the angles so they were correct.

Q Alright, sir. Now, one echo wasn't enough to place that shot number one, was it?

A (ia).

Q Do you recall how many echos you had on that shot?

A Three or four big echos and a lot of small ones.

Q Alright, sir. Do you recall where the second echo would have been?

A Yes. We got one echo off the bus, 'course that would be a very short duration--just go a little bit out of the way. One slant off the bus. And, again, that would get there only slightly after the

original muzzle blast.

Q     Alright.

A     I believe we also got one off this building down here.

Q     Alright--(ia)--you don't know what this building is, do you, the laundromat building, do you recognize it as that or...do--it--it's just a building?

A     Just a building.

Q     Alright sir. Okey, so when you got through plotting the three echos here and you also had the visual information from the smoke?

A     Well, that put us in the ballgame. That didn't tell us that's what it had to be. We saw smoke, we thought that was a good place to start...

Q     So this was a little easier than some of them because you had some visual information?

A     Yes, sir.

Q     Same thing with shot number 15 which I believe--and 19, which you--ah--were on the sidewalk right in here?

A     Correct.

Q     Now this is an area, once again, where you don't have much echo information?

A     That's correct.

Q     You had some?

A     Some of it was very light.

Q     Alright, if you would, take a different color here--try orange--and make a red dot where the cameraman was at the time number 15 was

fired?

A Approximately?

Q Approximately. Now approximately where the shot was fired. Now did you place this shot solely from visual information?

A Yes.

Q You didn't use any echos at all?

A There's echos there, that would be characteristic of a shot occurring, but not sufficient to say that it had to be at a certain place.

Q Alright, sir. Now, you would have got the one echo off the back of the wall behind the cameraman, wouldn't you?

A Correct.

Q Would you draw that one in? Alright, sir. And was that-- that would arrive very shortly after the muzzle--original muzzle blast wouldn't it?

A Correct. We could see it, but not sufficient (ia) to make final determination.

Q Alright sir. How long--if you would use this ruler--tell me approximately how long that echo was moving (west to east?)?

A That's two questions in one.

Q I've said approximately--they both would be very close I assume, so, you know, if you can tell the difference on... That's not a very precision yardstick I know.

A Alright, it looks like about 88 feet from the muzzle blast to the microphone; maybe about 105 feet total for the echo.

Q Alright, sir. If--if you would, ah, make that same... Well, hang on just a second. I assume if a shot were fired in this area right



up in here, that it would have approximately the same distance to travel, if there was an echo off of that wall?

A I don't exactly understand the question.

Q If another shot were fired right up in this area right here, it would travel, you know, approximately the same, is it possible that you could have gotten an echo off the back of this Honda, on shot number fifteen?

A My recollection in looking at it is the slope of the Honda is sufficient that that echo would not get here and end up over here.

Q Thank you. If--if you would, assuming that this is a (ia) approximate, how far is it from there to the end of the building?

A Forty feet.

Q Alright sir. So if this gun were moved down this way about forty feet, or no more than forty feet, you'd still have a chance, would you not, of getting an echo off this building?

A Actually, you'd move out more than forty feet because the angle gets more shallow as you move out.

Q Do you have an opinion as to about how much more you can take--in other words, if you got way on down here it would be coming at a more acute angle, and...

A I'd have to measure it out (ia) certainly it could be (ia).

Q Alright. How far is from, ah--well, let me ask you to do one more shot for me before I do that. Let's take one of the shots that occurred down in this area here, if you would--let me give you another color. Green.

A Any place here?

Q Yes. Or any--anyone you--just, just approximately. Show me what kind of echos you would expect to get with the same camera location?

A Well, you'd get a very large echo (ia). We also--be picking up a little bit off the windshield of this car right here (ia). We also would pick up an echo (ia) back buildings. (ia) but the angle is more slanted. The farther you go down the street, the more distance (ia). They would be the main echos. You, again, pick up a lot of small ones.

Q Alright, sir. Now, when you say that you get minimal echos from any shots fired in this area, what do you mean besides the ech--what other echos were you getting on minimal--that were minimal, besides the one off the back wall?

A We get echos, for instance, off the street.

Q But that goes down and back up?

A Correct. You also get echos on--I said there was no major echo off the back of the Honda--the sound hits it and it disperses instead of breaking off sharply. On a rounded surface it'll just go all kinds of directions. What happens is you get very low level echos, and it's very hard for me to say it came off there.

Q Let me give you a black pencil if we have it. Ask you to reproduce if you would the area from which you say it--the area north of Carver, which you said three, four and five may have come from. The one you pointed out to Mr. Linsin, but he didn't have you write on anything.

A Okey, just approximate?

Q Oh, yes, sir. Alright, sir. Now that--because of the minimal echos you were unable to say that you could place those as you had placed the other thirty-six?

A Correct.

Q Alright. Now you said that there was another area, and we'll have to get the ah--Mr. Linsin can I use your overlay to draw the other area?

Mr. Linsin: (ia)...admitted into evidence, it would be alright. I would appreciate it if you would not draw on the overlay.

Mr. Greeson: You don't want to draw that other area...?

Mr. Linsin: (ia)...and ask him to describe in particularity for the record, Mr. Greeson.

Mr. Greeson: As I recall your previous testimony--well, let me ask you, where is the--you said that you were ninety-nine percent sure that it was within this area right here?

A Correct. Limited to this area.

Q Yes, sir. And then you, ah, drew another square within that one, didn't you?

A I believe (ia)...

Q Alright, sir. Let me get you to draw that one in which you said that--that you were ninety-seven to ninety-eight percent sure that it came from within that smaller area?

A My recollection, it was just slightly on the (ia).

Q If you would, help me carry this up a little closer to the jury. Mr. (??) just said that we're a little bit far back. Bruce,

if you would, ah, --you still got your black--if you could make the black and the red a little bit darker. Mr. Koenig, would you help hold this up? Mr. Koenig, this has been identified as Government's D19c, ah, I wonder if you could get over there in front of the jury so they can see it, and it's been previously admitted into evidence. And I ask you if that's not the same map--not the very same copy--but the same drawing that you previously put your shots on at the former trial--a map that size?

A Ah, I don't think we used the whole map. I believe it was only part of the way down.

Q My question to you is this is a replica of the map that was up on the wall that you did your pointing to?

A My recollection is this part down here was not shown in court. (ia) west part of the (graph?) (grass?). I can't remember how much of (ia) was shown. I don't believe it went all the way down here.

Q Do you recall the map that was on the wall directly behind you while you were testifying?

A I remember -- my collection -- my recollection is it's the same thing but it didn't include all the areas to the east and west. That's just my recollection.

Q Okey. It could have been this side--or this size--but that's not what you may recall?

A That's correct.

Q Alright. You all can fold that up.

--end of tape--

of the  
FBI  
TECHNICAL SERVICES DIVISION  
FEDERAL BUREAU OF INVESTIGATION  
WASHINGTON, D. C. 20535

- 1 - Mr. Kohl (Rm. 3050)
- 1 - Mr. Castaneda
- 1 - Mr. Reames
- ① - Mr. Parks
- 3 - Mr. Koenig
- 4 - Ms. Bartz

Mr. William E. Swing  
Chief of Police  
Drawer W-2

To: Greensboro, North Carolina 27402 September 3, 1980

Attention: Captain James W. Hilliard  
Commanding Officer  
Staff Services Division

FBI FILE NO. 44-81521

LAB. NO. 91109083 E/S/D RD OC OY OZ

Re: GREENKIL

YOUR NO. 00107007 E RD  
 XXXXXXX 00109030 E RD  
 00411060 E OZ

Your No. 79-0145368

Examination requested by: Addressee and FBI Special Agent in Charge, Charlotte  
 Reference: Charlotte FBI letter dated November 6, 1979, and  
 Greensboro Police Department letters dated March 31,  
 1980, and June 11, 1980  
 Examination requested: Video Tape - Signal Analysis - Firearms - Photographic  
 Specimens received: Specimens were previously described in Technical  
 Services Report dated August 21, 1980

Result of examination:

An aural, visual, and electronic examination including high speed time-continuous waveform analysis and digital measurements was conducted of specimens 01, 0406, 0407, 0408, and 0409, copies of 01, 0406, and 0407, and various test recordings prepared by the Technical Services Division. The following information supplements the Technical Services Report dated August 21, 1980.

The locations of the muzzle blasts of gunshots 3, 4, and 5 all probably occur north of the intersection of Carver Court and Everitt Street, Greensboro, North Carolina, though no exact locations could be determined.

2 - Mr. [Redacted]  
Assistant District Attorney  
Post Office Box 2378  
Greensboro, North Carolina 27402

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2 - FBI, Charlotte (44-3527)

BEK/kmn\*  
(18)

This examination has been made with the understanding that the evidence is connected with an official investigation of a criminal matter and that this report will be used for official purposes only, related to the investigation or a subsequent criminal prosecution. Authorization cannot be granted for the use of this report in connection with a civil proceeding.

Shots on Ch 2  
2  
3  
4  
5

Specimens received January 7, 1980, under Laboratory Number  
00107007 E RD:

On January 7, 1980, personally delivered by Mr. [redacted]  
[redacted] WFMY-TV, Greensboro, North Carolina, Q406 - One 3/4"  
videocassette tape marked in part "WFMY-TV original tape of  
November 3, 1979, shooting in Greensboro, North Carolina, at the  
Anti-Klan Rally." Q406 returned to Mr. [redacted] same date. ✓

Specimens received January 9, 1980, under Laboratory Number  
00109030 E RD:

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On January 9, 1980, Mr. [redacted] WTVD, Durham,  
North Carolina, personally delivered (Q407, Q408, and Q409)  
three (3) 3/4" videocassette tapes marked in part "Original  
Recording of Greensboro Shooting - November 3, 1979." Q407,  
Q408, and Q409 were returned to Mr. [redacted] same date. ✓

Specimens received April 11, 1980, under Laboratory Number  
00411060 E OZ, from Greensboro Police Department, Greensboro,  
North Carolina:

ALSO SUBMITTED:

Four 8X10 black and white photographs of portions of a  
crime scene drawing

Two lists of vehicles and vehicle measurements

List of specific requests concerning gunshots from Channel 11,  
WTVD, video tape

Specimens received June 17, 1980, under Laboratory Number  
00411060 E OZ, from Greensboro Police Department, Greensboro,  
North Carolina:

ALSO SUBMITTED:

Two copies of 1-inch to 5-foot scale maps of the vicinity of  
the intersection of Carver Court and Everitt Street in  
Greensboro, North Carolina

Result of examination:

The Q1 video tapes are not sufficiently clear and the  
weapons depicted in the video tapes are not adequately detailed  
to make a determination as to their make(s), model(s), or  
caliber(s). It could only be stated that the handguns shown in  
the video tapes appear to be revolvers, as opposed to semiauto-  
matic pistols, and with one exception, the shoulder weapons

AUDIO ANALYSIS WORK SHEET

Examination  
Requested

Lab. No. 00109030 EQZ

Date:

Specimens:

Klan / Nazi Trial

Defence AT.

Prosecutors

(ADA)

(ADA)

(DA)

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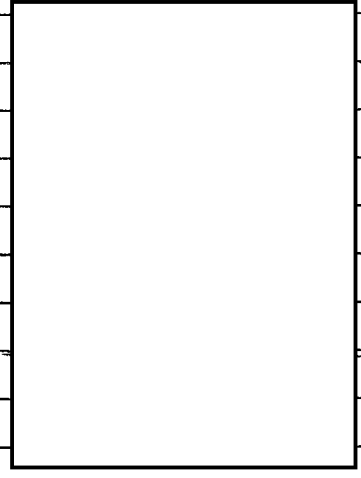
People to Check with on Case



Greensboro, N.C. Police Dept

" " " "

" " " "



Ast. DA



DA

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**Recorded**  
**11/28/79**  
**kmm**

FEDERAL BUREAU OF INVESTIGATION  
UNITED STATES DEPARTMENT OF JUSTICE

Laboratory Work Sheet

To: **SAC, Charlotte (44-3527)**

FBI FILE NO.

LAB. NO. **91109083 E RD QZ**

Re: **GREENKIL**

YOUR NO.

Examination by: **CASTANEDA**  
**KOENIG**  
**FIREARMS**

Examination requested by: **SAC, Charlotte**

Reference: **Letter dated 11/6/79**

Examination requested: **Video tape - Signal Analysis - Firearms**

Specimens received: **11/8/79, personally delivered by SA [redacted] Charlotte**

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**Q1 Video cassette tape labeled Sony KCA60**

**ALSO SUBMITTED:**

**One aerial photographic map**

# Memorandum

TO : DIRECTOR, FBI  
ATTN: [redacted] ROOM 3002  
SPECIAL INQUIRY SECTION  
CIVIL RIGHTS DIVISION,  
SAC, CHARLOTTE (44-3527) (P)

DATE: 11/6/79

91109083 - 2/S  
RD Q2  
Coates  
Kaenig

SUBJECT: GREENKIL

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Re Charlotte telephone calls to Bureau, 11/6/79.

Enclosed for the Bureau is one duplicate copy of a video cassette tape and one aerial photographic map, being hand-carried by SA [redacted]

For the information of the Bureau, the enclosed video cassette tape identified as Exhibit #1 contains film coverage of the anti-Klan rally and subsequent shootings which took place at Greensboro, N. C., on 11/3/79. The first section of film is a copy of footage provided by Television Station WGHP-TV in High Point, North Carolina, (an affiliate of the American Broadcasting Company); and the second section is a copy of footage provided by Television Station WXII-TV in Winston-Salem, North Carolina, (an affiliate of the National Broadcasting Company).

The aerial photographic map enclosed depicts the area in Greensboro, N. C., where the shootings took place.

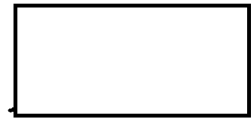
REQUEST OF THE BUREAU:

The FBI Laboratory, Special Projects Section and Scientific Analysis Section, are requested to examine the enclosed video cassette tape and aerial photographic map and determine the following:

- (1) The number of shots fired;
- (2) The time frame in which shots fired;

3 - Bureau (Encls. 2)  
2 - Charlotte (44-3527)

ZTL:rep  
(5)



54

cc CREW  
11/8/79  
\*

MAP retained  
BY CREW  
11/8/79  
H



CE 44-3527

- (3) Weapons which actually were fired as depicted in the films;
- (4) Number of times a particular weapon was fired at any given time;
- (5) Direction and/or angle in which weapons were fired;
- (6) Number and types of weapons visible in the film;
- (7) Whether or not weapons were being fired other than those visible in the film and, if so, how many and from what locations they were fired.

Provide still shots of selected portions of the films which depict acts of violence identifiable to any particular person or persons.

Provide five copies each of close-up still shots of any person who might be subject, victim, or witness, for display and identification purposes.

RECORDED

4/21/80

lab

FEDERAL BUREAU OF INVESTIGATION:  
UNITED STATES DEPARTMENT OF JUSTICE

Work Sheet

Mr. William E. Swing  
Chief of Police  
Greensboro, North Carolina

To:

Attention: Captain James W. Hilliard  
Commanding Officer  
Staff Services Division

FBI FILE NO. 44-81521

LAB. NO. 00411060 E QZ

Re: ROLAND WOOD, RAYFORD CAUDLE,  
JACK FOWLER, SUBJECTS;  
JAMES WALLER, WILLIAM SAMPSON,  
SANDY SMITH, VICTIMS;  
CRIMINAL HOMICIDE

YOUR NO. 79-0145368

Examination by: KOENIG

Examination requested by: Addressee

Reference: Letter dated 3/31/80

Examination requested: Video Tape - Special Projects Section

Specimens received: 4/11/80

- ALSO SUBMITTED*
- ~~Q1950 - Q1953~~ Four 8 x 10 black and white photographs
  - ~~Q1954~~ One list of vehicles and vehicle measurements.
  - ~~Q1955~~ One list of vehicles and vehicle measurements for the Exhibit Section, attention
  - ~~Q1956~~ One list of specific requests concerning gunshots from Channel 11, WTVD, videotape.

*to*  *4/20*  
*copy to J* b6  
b7c



4/11/80



**CITY OF GREENSBORO**  
NORTH CAROLINA

March 31, 1980

Mr. William H. Webster, Director  
Federal Bureau of Investigation  
United States Department of Justice  
Washington, D. C.

00411060 - EQ  
*Koenig*

Attention: F.B.I. Laboratory: Sound Engineering Section  
and Exhibits Section

Reference: G.P.D. Case Number 79-0145368  
F.B.I. File Number 44-81521  
F.B.I. Laboratory Number 91119065, S, QY, UF, MC, UQ, RF, RU  
F.B.I. Laboratory Number 00212051, S/D, QY, UR, MC, RF, UQ, PN  
F.B.I. Laboratory Number 00220065, S, QY, RF

Victims: James Waller, William Sampson, Sandy Smith, and Others

Suspects: Roland Wood, Rayford Caudle, [redacted] and Others

Crime: Criminal Homicide/Murder

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Dear Mr. Webster:

The enclosed material is being sent by registered mail as per the request of your Laboratory to aid them in their examination of previously submitted evidence.

The items that are enclosed are listed below.

1. Four 8 x 10 black and white photographs of portions of a crime scene drawing.
2. One list of vehicles and vehicle measurements.
3. One list of vehicles and vehicle measurements for the Exhibit Section, attention [redacted]
4. One list of specific requests concerning gunshots from Channel 11, WTVD, videotape.

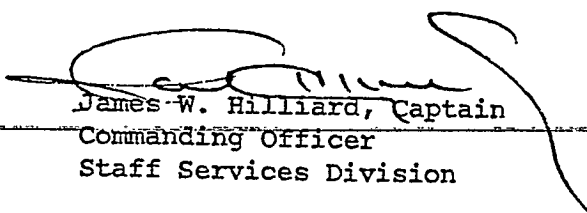
~~INDEX EGG~~

Mr. William H. Webster, Director  
March 31, 1980  
Page 2

This evidence, which should be returned to us, has not been previously, nor will it be, examined by any other experts. The results of this analysis will be used solely for the purposes of criminal prosecution. If you have any questions concerning this submission, please contact

Sincerely,

William E. Swing  
Chief of Police

  
James W. Hilliard, Captain  
Commanding Officer  
Staff Services Division

JWH/swm/70.71

Enclosures

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# CITY OF GREENSBORO

NORTH CAROLINA

DRAWER W-2  
GREENSBORO, N.C. 27402

June 11, 1980

William H. Webster, Director  
Federal Bureau of Investigation  
United States Department of Justice  
Washington, D. C.

Attention: Audio Analysis Unit, Mr. Parks

Reference: James Waller and others - Victims  
Roland Woods and others - Suspects  
Homicide  
G.P.D. No.: 79-0145368

Dear Mr. Webster:

Enclosed are copies of blueprints which Mr. Parks, of your Audio Analysis Unit, requested.

If we can provide any additional information or assistance, please do not hesitate to contact us.

Sincerely,

William E. Swing  
Chief of Police

*JWHilliar*  
J. W. Hilliard, Captain  
Staff Services Division  
Greensboro Police Department

WES/JWH/1h/25

Enclosures

*rec. 6/17/80  
in a sealed  
container.  
B&K*



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TELETYPE UNIT

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COMMUNICATIONS SECTION

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OO HQ

DE CE

O 041849Z JAN 80

FM CHARLOTTE (44-3527)

TO DIRECTOR (44-81521) IMMEDIATE

BT

UNCLAS

GREENKIL

*Lat*  
*Koenig*  
*Castro*  
*Wikes*  
*Reem*  
*Wallace*  
*Richardson*  
*Havke*  
*Tobin*  
*Boyle*  
*Cronin*  
*Strain*

RE CHARLOTTE TELCALL TO FBI HEADQUARTERS, CIVIL RIGHTS SECTION AND FBI LABORATORY, ON JANUARY 3, 1980.

ARRANGEMENTS HAVE BEEN MADE WITH TV NEWS MEDIA PERSONNEL WHO COVERED THE SHOOTING INCIDENT AT EVERETT AND CARVER STREETS, GREENSBORO, NC, ON NOVEMBER 3, 1979, TO TRAVEL TO THE FBI LABORATORY ON JANUARY 7 AND 9, 1980, TO PRODUCE THE ORIGINAL TAPES FILMED BY THEIR CREWS SO THEY CAN BE COPIED BY THE VIDEO AND SOUND SECTION OF THE FBI LABORATORY.

ON JANUARY 7, 1979, THE FOLLOWING TV NEWS MEDIA PERSONNEL WILL BE AT FBI HQ, WASHINGTON, D.C. - FBI LABORATORY WITH ORIGINAL TAPES:

CHANNEL 8 - ABC AFFILIATE, HIGH POINT, NC, MR.

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PAGE TWO CE 44-3527 UNCLAS

[REDACTED] NEWSCASTER; AND MR. [REDACTED] TV CAMERAMAN. MR.

[REDACTED] WILL HAVE CUSTODY OF THE VISUAL TAPES FILMED BY CHANNEL 8 ON NOVEMBER 3, 1979.

CHANNEL 2 - CBS AFFILIATE, GREENSBORO, NC, JR. [REDACTED]

CAMERAMAN. MR. [REDACTED] WILL BRING ORIGINAL FILMS AND VIDEO TAPES FILMED BY HIM ON NOVEMBER 3, 1979. CHANNEL 2 IS ALSO SENDING UP ADDITIONAL PERSONNEL FOR POSSIBLE INTERVIEW WITH BUREAU OFFICIALS AND LABORATORY OFFICIALS RE FBI INVESTIGATION

IN THIS MATTER.

CHANNEL 12 - NCB AFFILIATE, WINSTON-SALEM, NC, MR. [REDACTED]

[REDACTED] CAMERAMAN. MR. [REDACTED] WILL HAVE WITH HIM ORIGINAL FILMS TAKEN BY HIM ON NOVEMBER 3, 1979. MR. [REDACTED] IS THE CAMERAMAN WHO WAS WOUNDED BY GUNFIRE ON THAT DATE.

ON JANUARY 9, 1980, REPRESENTATIVES OF CHANNEL 11, ABC AFFILIATE, DURHAM, NC, WILL COME TO THE FBI LABORATORY:

MR. [REDACTED] NEWSCASTER, AND MR. [REDACTED] CAMERAMAN.

MR. [REDACTED] WILL HAVE WITH HIM ORIGINAL VIDEO TAPE OF INCIDENT BEING RECORDED AT EVERETT AND CARVER STREET ON NOVEMBER 3, 1979.

ALL OF THE ABOVE TV NEWS REPRESENTATIVES HAVE REQUESTED

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PAGE THREE CE 44-3527 UNCLAS

AN INTERVIEW WITH AN FBI OFFICIAL OF THE CIVIL RIGHTS SECTION OR OTHER FBI OFFICIAL WHO COULD BE INTERVIEWED RELATIVE TO THE PRIORITY OF THE INVESTIGATION ASSIGNED BY FBI HQ FOR GREENKIL. INTERVIEW WOULD BE LIMITED TO GENERAL INFORMATION OF THE FBI'S JURISDICTION, AND ALSO OF THE PRIORITIES OF THE INVESTIGATION; AND IT IS NOT EXPECTED ANY QUESTIONS OF SUBSTANCE REGARDING EVIDENTIARY NATURE WILL BE ASKED BY REPORTERS.

REPORTERS HAVE ALSO REQUESTED OPPORTUNITY TO INTERVIEW REPRESENTATIVE OF FBI LABORATORY FOR A GENERAL DISCUSSION OF THE NATURE OF EXAMINATIONS TO BE CONDUCTED AND AGAIN, NO SUBSTANCE OF THE INTERVIEW WILL GO INTO THAT AREA WHICH COULD BE CONSIDERED EVIDENTIARY NATURE. BASICALLY, THESE REPORTERS ARE INTERESTED IN A "SHOW AND TELL" TYPE INTERVIEW AS VERY LITTLE IS KNOWN ABOUT THE FBI'S CAPABILITY IN THE LABORATORY, PARTICULARLY IN AUDIO AND SOUND ANALYSIS.

FBI HQ REQUESTED TO TAKE INTO CONSIDERATION REQUESTS OF THESE TV NEWS MEDIA PERSONNEL FROM THE GREENSBORO, WINSTON-SALEM, HIGH POINT, AND DURHAM AREAS AND IF DEEMED APPROPRIATE, HAVE APPROPRIATE BUREAU OFFICIALS AVAILABLE FOR INTERVIEW ON JANUARY 7 AND 9, 1986.

PAGE FOUR CE 44-3527 UNCLAS

ALSO, ACCOMPANYING THE TV NEWS MEDIA PERSONNEL WILL BE SA [REDACTED] GREENSBORO RA, WHO IS COORDINATING FBI LABORATORY EFFORTS WITH THE STATE INVESTIGATORS, PROSECUTORS, AND NEWS PEOPLE COMING TO WASHINGTON, D.C. STATE PROSECUTOR [REDACTED] AND [REDACTED] DISTRICT ATTORNEY'S OFFICE,

GREENSBORO, NC, WILL ALSO BE ARRIVING AT WASHINGTON, D.C. AND FBI HEADQUARTERS ON JANUARY 7, 1979, TO DISCUSS WITH FBI LABORATORY PERSONNEL: SPECIAL PROJECTS, ENGINEERING, AND OTHER RELATED LABORATORY SECTIONS, THE CAPABILITIES OF OUR LABORATORY TO ASSIST THEM IN THEIR PROSECUTION AND TO DEVELOP A MUTUAL UNDERSTANDING OF WHAT THE FBI LABORATORY CAN AFFORD THE STATE PROSECUTORS AND WHAT THE STATE PROSECUTORS ARE LOOKING TO PRESENT IN THE FORM OF EXPERT TESTIMONIES AND PHYSICAL EVIDENCE.

UACB, SA [REDACTED] WILL TRAVEL TO FBI HQ ON JANUARY 7, 1979, TO COORDINATE THE INTRODUCTION TO FBI LABORATORY FROM TV NEWS MEDIA AND TO COORDINATE THE MEETINGS OF STATE DISTRICT ATTORNEYS AND INVESTIGATOR PERSONNEL WITH FBI HQ AND FBI LABORATORY.

BT

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O-CID + Lot

Channel 11 Video Tape

On 1/9/80 at Quantico under the supervision of SA [redacted] and other video experts (see channel 2 video tape) the channel 11 video tapes <sup>(3 - Q407, Q408, Q409)</sup> were copied onto the left channels of two Nagra SJ (one DC powered and one AC powered) at 15 ips, 1/2 track, with the right channel recording time code data from a System Donner model 8154 Time Code Generator (IRAQ B). Each on a 7" reel, 1.5 mil Q407 has pertinent information.

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On 1/9/80 [redacted] channel 11 cameraman, advised microphone on a 10' cable, usually 5'-6' to the right of camera.

On 1/9/80 [redacted], News Reporter Channel 11 advised he was crowded next to cameraman on his right with microphone in hand.

## Channel 2 Video Tape

On 1/7/80 at Building 6 at FBI facilities in Quantico  
Maine Base Quantico Va met with FBI employees [redacted]  
[redacted] in the video tape  
facilities. Joined by SA [redacted] and TV cameraman  
[redacted] from WFMY-TV, channel 2, Greensboro, N.C.  
who had a 3/4" video cassette (Q406). Police officers and state  
prosecutors from Greensboro, N.C., also present.

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~~then~~  
SA [redacted] and the other video experts played back Q406  
and provided an unprocessed audio track which I recorded  
on the left channel of a Nagra SJ<sup>revised</sup> at 15ips, 1/2 track, with  
the right channel recording time code data from a Systron Downey  
model 8154 Time Code Generator (IRAQ B). 7" reel, 1.5 mil.

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[redacted] advised that he was replacing a fuse  
in his video equipment when the shooting began. He soon thereafter  
ran back to the front passenger side of vehicle 29 and then almost  
immediately went behind the car to the back right rear corner. A  
man with a derringer was also behind vehicle 29 on his left.

Channel 8 Film

00107050 2 92

On 1/8/80, SA [redacted] played back the original film recording from channel 8, and SA [redacted] copied it onto a Nagra 55 (left channel) at 15 ips with the right channel having time code information from a System Donner model 8154 Time Code Generator (TRAQB) onto a 7" reel, 1.0 mil, 1/2 track stereo.

On 1/8/80, [redacted] <sup>TV</sup> cameraman for channel 8, WGHP, High Point, N.C., stated in the street on the south side of the intersection of Carver Court and Everett Street when the shooting started. He then ran to behind vehicle 30 and started filming at the right rear corner. His microphone is attached to the camera.

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On 1/8/80, newscaster [redacted] could not add any additional information on camera location.

0010705029

Channel 12 Video Tape

No copies of soundtrack made since camera was not on during shooting.

On 1/7/80, [redacted] former reporter for Channel 12-TV, Winston-Salem, N.C. stated that the cameraman was approximately 2'-3' in front of news car before shooting. When shooting started, the cameraman of [redacted] crawled under news car.

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G.P.D. Case Number: 79-0145368  
F.B.I. File Number: 44-81521  
Crime: Criminal Homicide/Murder  
Source: Videotape Made By Channel 11, WTVD

As per the request of the F.B.I. Laboratory, listed below are specific requests to determine gunshots from the above-mentioned tape.

1. Pinpoint location of the shot fired at approximately 11:28:12 on videotape.
- 4 2. Verify the noises at 11:30:12 and 11:54:14 are not gunshots.
- 5 3. During the stick fight, 11:45:00 to 11:52:29, were any shots fired and from what direction did these shots originate.
- 2 4. The white male subject carrying the shotgun who leaves the videotape scene at approximately 12:28:?? and reenters view at approximately 12:33:??, during the interim period, were any shots fired and from what direction did they come.
- 3 5. Between 12:20:22 and 12:22:22, was the white male, black hair, jean jacket and pants, on sidewalk near pickup truck firing a pistol(s) how many times did he fire pistol(s) and what time frame on slow motion film did he fire.
- 6 6. Verify the white female in the yellow rain suit top fired weapon between 12:21:?? and 12:28:?? and how many times did she fire.
- 7 ~~7. At approximately 12:45:06 were there gunshots and from what direction did they originate.~~



Speed of Sound Determination:

On 6/6/80 [redacted] Greensboro, N. C. Police Department advised telephonically that the National Weather Service in Greensboro, N. C. recorded the following temperatures and barometric pressures on 11/3/79:

b6  
b7c

11:00 am -  $54^{\circ}\text{F}$ , BP 30.04

12:00 noon -  $56^{\circ}\text{F}$ , BP 30.04

Shots occurred at approximately 11:30 am.

Table 1-1 "Properties of Dry Air at Atmospheric Pressure - English Units" in <sup>CRS</sup> Handbook of table for Applied Engineering Science, 2nd Edition (1973) page 9 states the following:

$53^{\circ}\text{F} \Rightarrow$  speed of sound = 1111 ft/sec

$62^{\circ}\text{F} \Rightarrow$  " " " = 1120 ft/sec

Calculating for  $55^{\circ}\text{F} = 1113\text{ ft/sec}$

For a  $50^{\circ}\text{F}$  to  $60^{\circ}\text{F}$  range  $\approx 1108$  to  $1118\text{ ft/sec}$

Since maximum echo distance used was less than 170 feet, even with a  $\pm 5^{\circ}\text{F}$  temperature distance the maximum error is  $\pm 0.75$  feet.

Equipment Used:

Visual: Videocassette copies played back on a Sony VO-2600 Videocassette Recorder and a JVC Color Monitor, model 7830UH

Visicorder: Honeywell ~~2112~~ 2112, Dual Channel, 12" paper, 500 cm/sec and at 500 cm/sec, time code on channel 2 of records off Nagra ST recordings from soundtracks. Honeywell 8106A, single channel 6" paper, 250 cm/sec and 25 cm/sec. Kodak Lunagraph Direct Print Paper, types 2167, 1895 and 2295

Aural: Nagra ST recordings from soundtracks played back on a Revox A700, 1/2 track left, 15 ips and 1 7/8 ips, Beyers DT 430 headphones used.

Analysis: Used a 1" to 5' scale map, aerial photo blow-ups (40" x 60" of larger), vehicle list provided by Greensboro, P.D., vehicle placed on map by planimeter's CSA [redacted], 8' long aluminum straightedge, 10' tape measure in mm's, 61 cm calibrated rule in 1/2 mm's, several protractors, various drafting equipment, specially built wire holders, clear plastic overlay of map, and various pens of different colors

b6  
b7c

Equipment Specifications:

## 1. Nagra IV SJ

On 6/11/80, according to Nagra Engineer [redacted]  
the speed error at 15 ips is:

Typical .05% P-P  
Max .07% P-P  
RMS .028%

b6  
b7c

2. BVM-100 Video Recorder, Sony Corp (used by Channel 11 according to [redacted]).  
According to [redacted] Video Engineer, Sony ~~Broadcast~~ Broadcasting Service (NY) [redacted] advised that speed error at 3 3/4 ips is ~~not~~

0.2 cm short run (under 10 cm of tape) - start up  
0.0 cm over 10 cm of tape or longer  
less than .25% RMS (W & F)  
less than .024 cm/sec velocity error

3. JVC-4400 Video Recorder, JVC (used by Channel 2 according to [redacted]).  
According to [redacted], Field Service Engineer, JVC, N.Y. [redacted] advised the speed error at 3 3/4 ips is

RMS (W & F) less than .25%  
Velocity error ~~not~~ less than .024 cm/sec.

4. Sony VO-2850 Video recorder (Playback for Channels 11 & 2 at Quantis)

According to Electronic Technician Steve Lambert, Senior TV Engineer, Quantis and [redacted] (referred to under # 2 above) advised the speed error is:

RMS (W & F) less than 0.2% RMS  
Velocity error less than 0.19 cm/sec.

b6  
b7c

## Equipment Specifications:

5. Rockland 5100 Programmable Freq Synthesizer according to manual has .001 Hz resolution across entire range, at 500 Hz = ~~.0002~~ .0002% error max

6. Honeywell 2112 Versodes at 500 cm/sec adjusted to less than .05% speed error

7. Revco A700 accuracy to manual

Weighted Peak Flutter  $< \pm .06\%$  at 15 ips.  
 $< \pm .1\%$  at 3 3/4 ips

00107050-242  
Visicorder Copies Prepared:

At 25 cm/sec (6" paper) (Q407)

1. Pertinent portion of channel 11" (from before transit 1 to after last gunshot)
2. Pertinent portion of channel 2 (from before transit 1 to after last gunshot) - not same as transit 1 on channel 11.
3. Pertinent portion of channel 8 (from before 1<sup>st</sup> gunshot to after last gunshot)
4. Rapid fire test of 0.357 paper revolver
5. Dry fire test of " " "

At 50 cm/sec (12" paper)

1. Pertinent portion of channel 11 (Q407) - from before transit 1 to after last gunshot (time-code info on other channel)
2. Pertinent portion of channel 2 - from before transit 1 (on channel 2) to after last gunshot (time-code info on other channel)

At 250 cm/sec (6" paper)

1. All gunshots of suspected gunshots on channel 11 (Q407)
2. All gunshots of suspected gunshots on channel 2

At 500 cm/sec (12" paper)

1. All gunshots of suspected gunshots on channel 11 (Q407)
2. All gunshots of suspected gunshots on channel 2
3. All gunshots of weapons tests at Quantico.

## Error Calculation - Muzzle Blast & Microphone Locations

Most (99% or better) of the echoes used for measurement traveled 80 feet or less. farther than the main muzzle blast (typical situation), however a few traveled as much as 170 feet. The temperature is most likely accurate to within  $\pm 1^\circ\text{F}$  however  $\pm 5^\circ\text{F}$  was taken as a maximum range.

<u>Error Factor</u>	<u>Max Error Possible</u>	<u>Max Error Expected</u>
1. Ambient Temperature:	$\pm 0.75$ feet	$\pm 0.07$ feet
2. Video Recorders at scene	$\pm 0.42$ feet	$\pm 0.20$ feet
3. Play back on video recorder at Quantico	$\pm 0.34$ feet	$\pm 0.16$ feet
4. Nagra recorder playback and recorder	$\pm 0.12$ feet	$\pm 0.04$ feet
5. Visicoder	$\pm 0.08$ feet	$\pm 0.04$ feet
6. Echo Measurement ( $\pm .025$ cm)	$\pm 0.05$ feet	$\pm 0.02$ feet
7. Map Measurement ( $\pm .025$ cm)	$\pm 0.05$ feet	$\pm 0.02$ feet
Total error	$\pm 1.81$ feet	$\pm 0.55$ feet

# Error Calculation - Absolute Times

## Error Factor

1. Ambient Temperature

Max Possible Error  
( $\pm 5^{\circ}\text{F}$ )  $\pm 0.45\%$

Max Expected Error  
( $\pm 1^{\circ}\text{F}$ )  $\pm 0.09\%$

2. Video Recorders at scene

$\pm 0.25\%$

$\pm 0.20\%$

3. Play back on video recorder at Quantis

$\pm 0.20\%$

$\pm 0.15\%$

4. Time Code Generator Error

Negl.

Negl.

5. Measurement Error

$\pm 0.20\%$

$\pm 0.05\%$

Total Error  $\pm 1.10\%$

$\pm 0.49\%$

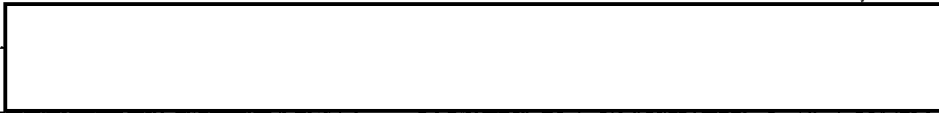
IDENTIFICATION

DIMENSIONS OF VEHICLES

①

00411060EQZ

#1.



LENGTH: 19'8"

WIDTH: 6'7"

#2.



LENGTH: 19'6"

WIDTH: 6'6"

b6  
b7C

#3.



LENGTH: 18'6"

WIDTH: 6'5"

#4.



LENGTH: 16'2"

WIDTH: 6'7"

#5.



LENGTH: 18'5"

WIDTH: 6'4"

#6.



LENGTH: 18'7"

WIDTH: 6'3"

b6  
b7C

#7.



LENGTH: 17'9"

WIDTH: 6'1"



#8.



LENGTH: 19' 8"      WIDTH: 6' 7"

#9.



LENGTH: 16' 3"      WIDTH: 5' 10"

b6  
b7c

#10



LENGTH: 17' 10"      WIDTH: 6' 2"

#11



LENGTH: 28' 10"      WIDTH: 7' 11"

#12



LENGTH: 16' 2"      WIDTH: 5' 10"

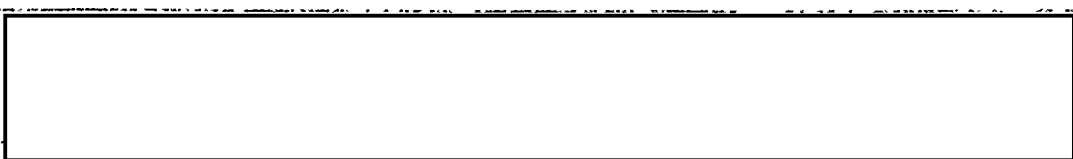
#13



LENGTH: 17' 11"      WIDTH: 6' 8"

b6  
b7c

#14.



LENGTH: 16'      WIDTH: 5' 10"

00411060EQZ

3

) #15, [redacted]

LENGTH: 13' 4"      WIDTH: 5' 4"

#16

[redacted]

LENGTH: 16' 3 1/2"      WIDTH: 5' 11"

b6  
b7c

#17,

[redacted]

LENGTH: 17'      WIDTH: 5' 10"

) #18,

[redacted]

LENGTH: 17' 11"      WIDTH: 6' 8"

#19,

[redacted]

LENGTH: 17' 8"      WIDTH: 6' 7"

#20

[redacted]

LENGTH: 11' 5"      WIDTH: 4' 9"

b6  
b7c

) #21,

[redacted]

LENGTH: 12' 2"      WIDTH: 5' 7"

#22



LENGTH: 14' WIDTH: 5'6"

#23



LENGTH: 16'4" WIDTH: 6'

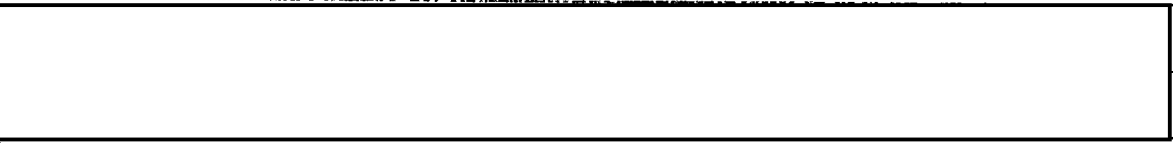
b6  
b7C

#24



LENGTH \_\_\_\_\_ WIDTH \_\_\_\_\_

#25



LENGTH: 14' WIDTH: 5'5"

#26



LENGTH: 16'4" WIDTH: 5'8"

#27



b6  
b7C

LENGTH: 16'6" WIDTH: 6'

#28



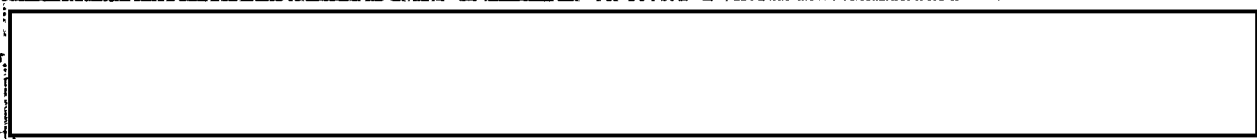
LENGTH: 15'4 7/8" WIDTH: 6'7"

#29



LENGTH: 18'2" WIDTH: 6'5"

#30



LENGTH: 17'1" WIDTH: 6'2"

#31



LENGTH: 13'10" WIDTH: 6'

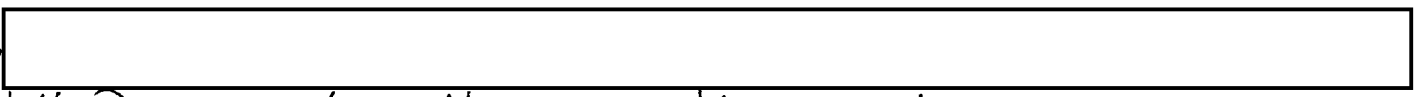
b6  
b7c

#32



LENGTH: 12'11" WIDTH: 4'9 1/2"

#33



4 Door. Length & width unknown

#34



LENGTH: 22'6" WIDTH: 8'

#35



LENGTH: 15'7" WIDTH: 5'8"

#36. UNKNOWN VEHICLE Poss [redacted]  
Green, Length + width unknown.

#37. [redacted]

LENGTH: 17' 5"      WIDTH: 6' 7 1/2"

#38. [redacted]

LENGTH: 18' 6"      WIDTH: 6' 6"

#39. [redacted]

LENGTH: 17' 1"      WIDTH: 5' 10"

b6  
b7c

#40 [redacted]

LENGTH: 17' 2"      WIDTH: 6' 3"

#41 [redacted]

LENGTH: 17' 1"      WIDTH: 6' 6"

#42 [redacted]

LENGTH: 18' 11"      WIDTH: 6' 5"

#43,



LENGTH: 18'2"      WIDTH: 6'4"

#44



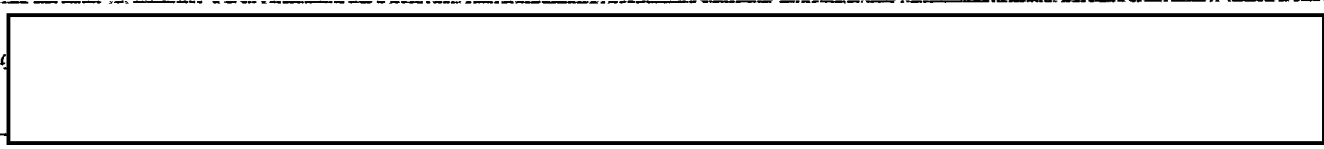
Does not enter Diagram Area, not measured.

#45,



LENGTH: 18'4"      WIDTH: 6'7"

#46



LENGTH: 15'7"      WIDTH: 6'7"

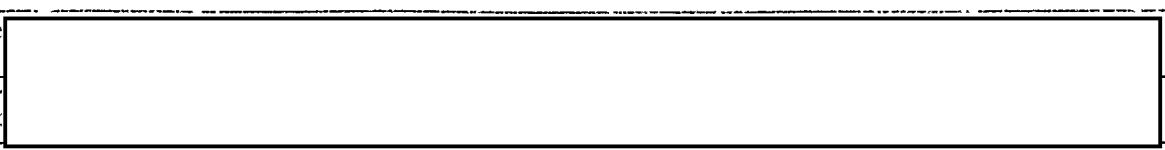
b6  
b7c

#47



Does not enter Diagram Area, not measured.

#48,



LENGTH: 18'4"      WIDTH: 6'5"

#49,



LENGTH: 16'6"      WIDTH: 6'2"

(NOT POSITIVELY IDENTIFIED AT THIS TIME)

00411060EQZ

8

#50. UNIDENTIFIED VEHICLE.

#51

LENGTH: 17' 11"      WIDTH: 6' 5"

#52

LENGTH: 16' 2"      WIDTH: 5' 7"

(POLICE CAR)

#53

LENGTH: 17' 2"      WIDTH: 6' 1"

(POLICE CAR)

b6  
b7c

#54

LENGTH: 18' 3"      WIDTH: 6' 7"

#55

~~is~~ Does not enter diagram Area, Not measured

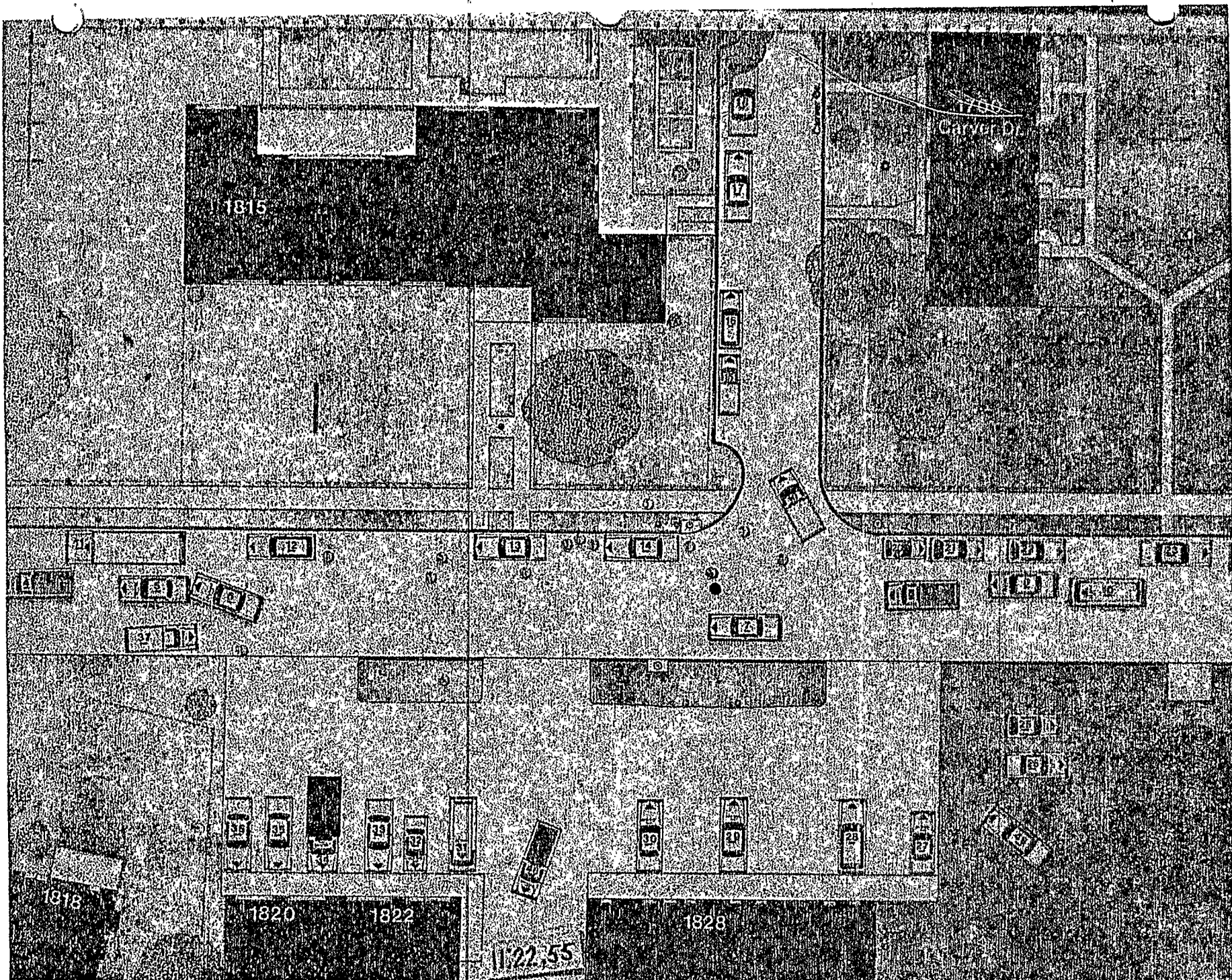
#56

UNKNOWN LICENSE NUMBER

Does not enter diagram Area, not identified as yet.

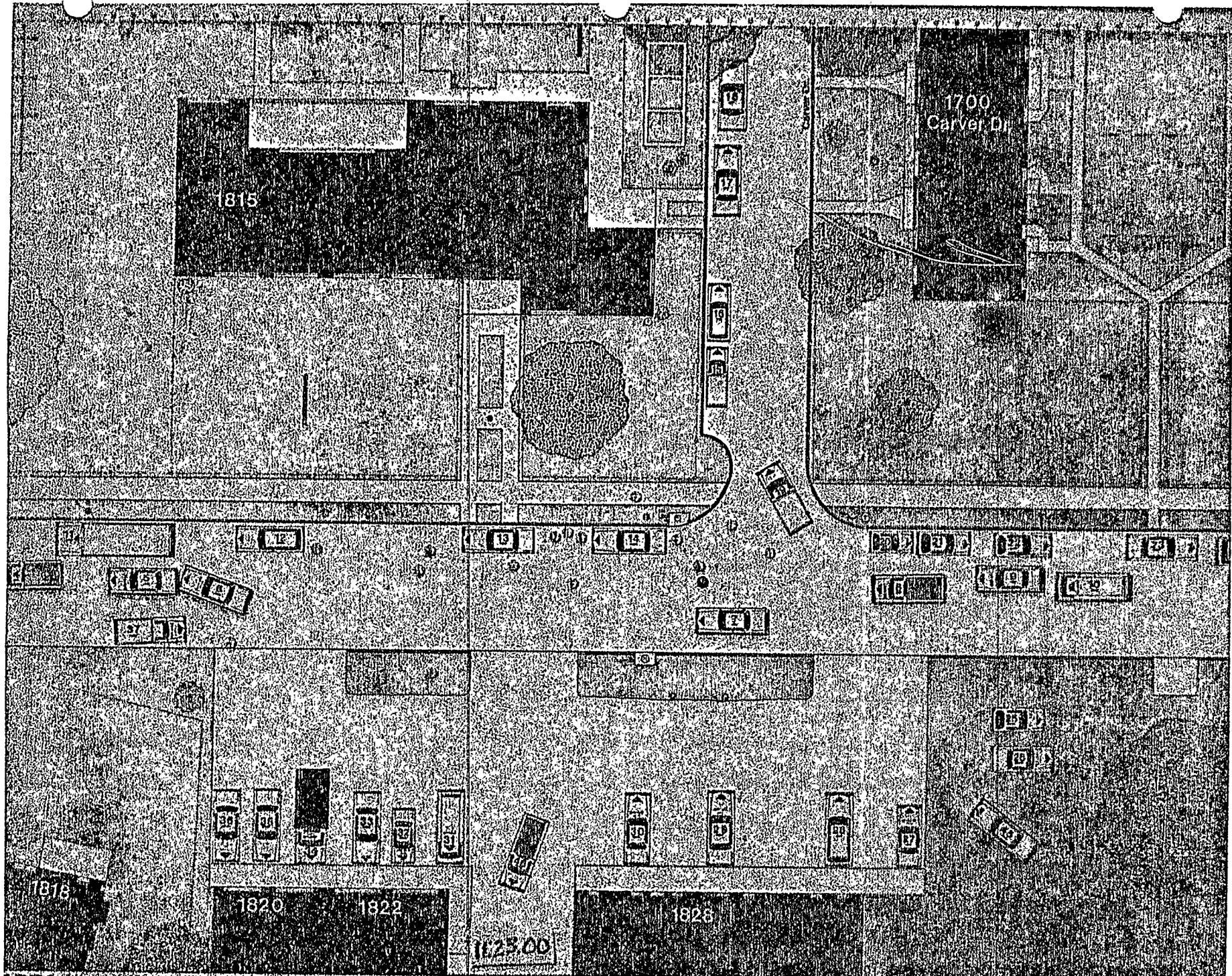
END

*[Handwritten signature]*

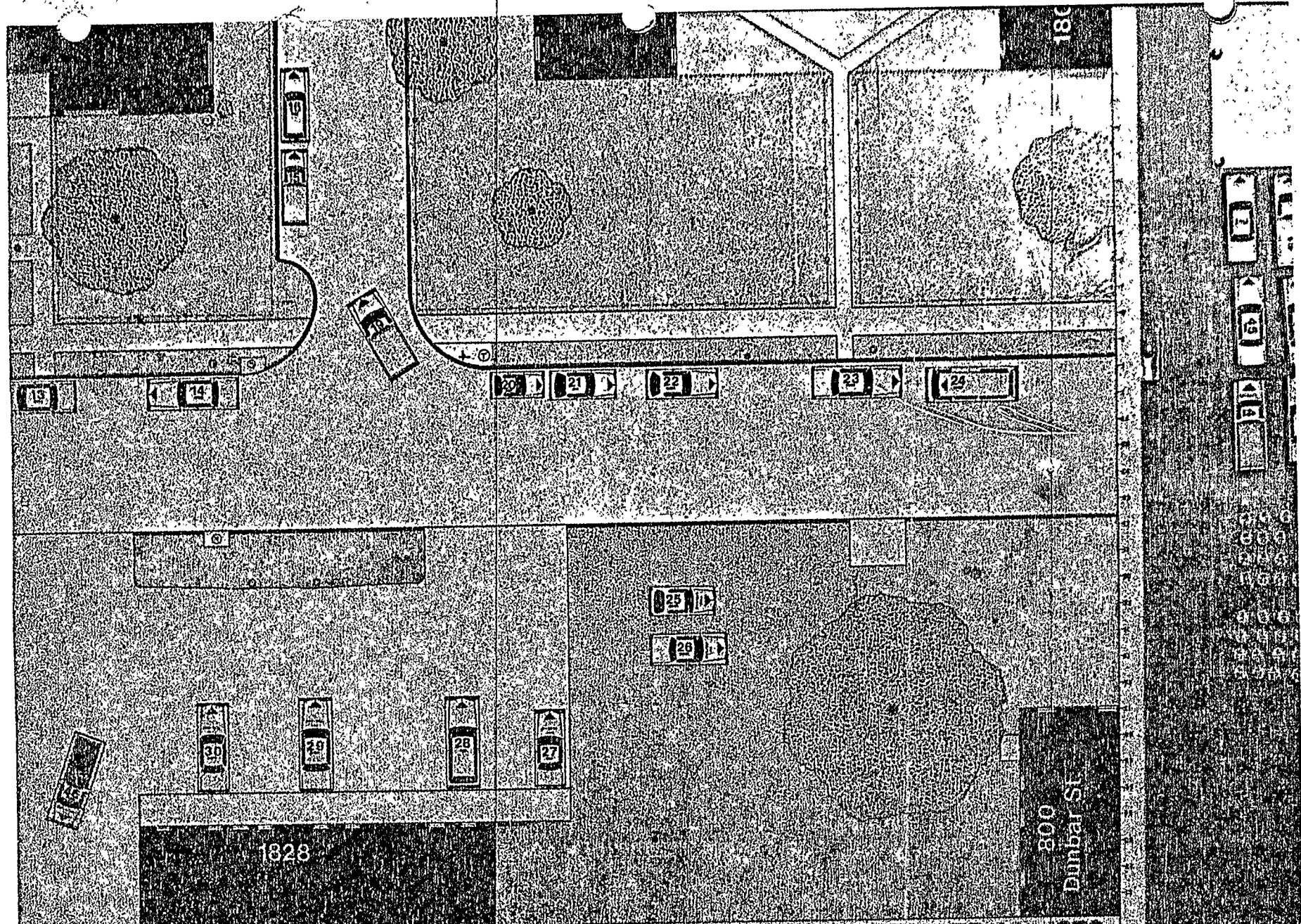


AREA 1 inch=5 foot HOMICIDE Date of Case NOVEMBER 3, 1979 Drawn By J.R. Ballance File No. 370 DECEMBER





AREA 1 inch = 5 feet HOMICIDE NOVEMBER 3, 1979 J.R. Ballance 379 DECEMBER

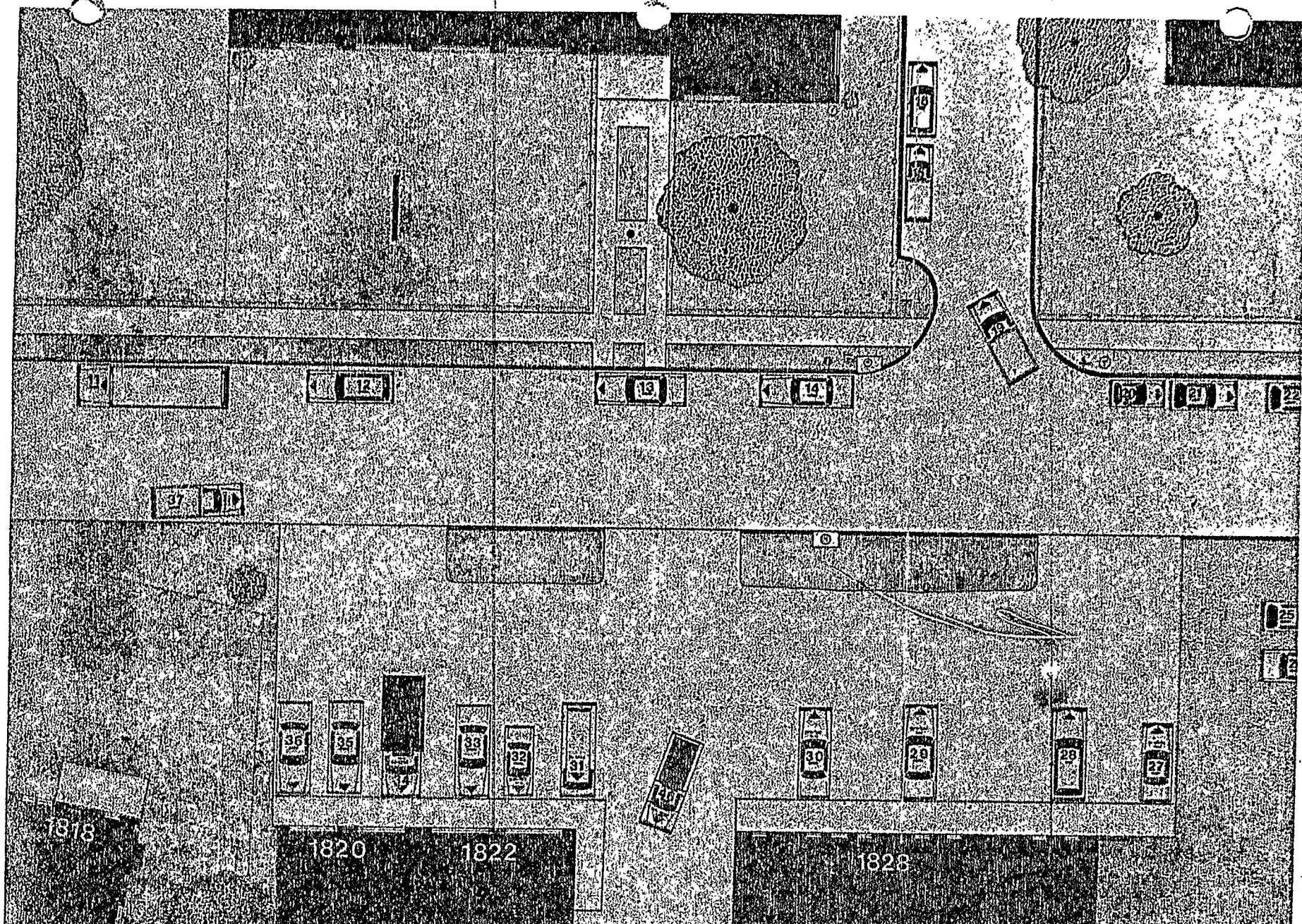


180

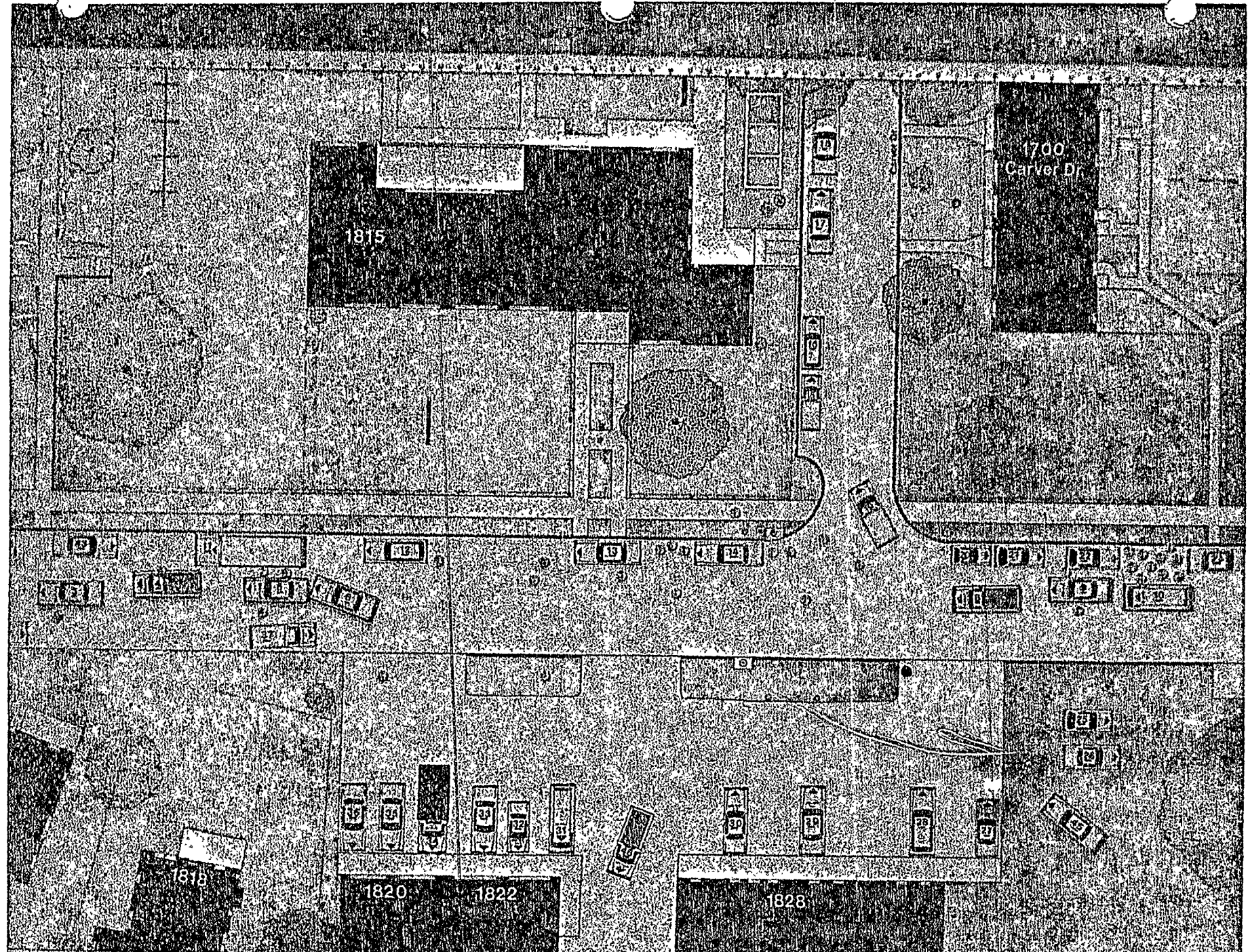
1828

800  
Dunbar St

NOVEMBER 3, 1979 Drawn by: J.R. Ballance Bedpa Number: 379 Date Enlarged: DECEMBER 10, 1979



AREA: **1 inch = 5 foot**   
 Crime: **HOMICIDE**   
 Date Depicted: **NOVEMBER 3, 1979**   
 Drawn By: **J. R. Ballance**   
 Badge Number: **37**



CARVER DR. AREA Scale: 1 inch = 5 feet Title: HOMICIDE Date Drawn: NOVEMBER 3, 1979 Drawn by: J.R. Ballance Page Number: 379 Date Plotted: DECE

00107007 EQ  
A

Transient Analysis (measurement) of Q406 (Claim 2)  
under Lab # 00107007 EQ 2 RD.

Decscope terminal model VT-52 connected to PDP 11/70  
computer. Program on account [275, 1] (Program attached).  
Used an ALTEK Corp model AC-90C digitizer. Printout  
of analysis from HP 97 Programmable Calculator (Program  
attached). Also used a TI Programmable 59 Calculator  
(Program attached) and a ~~TI~~ TI PC-100A Hard Copy  
Printer.

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LIST

SKILL 8-AUG-80 13:01:11

10 PRINT

15 N=1

20 PRINT "ENTER NEW BASE OR START POINT"

25 PRINT

30 INPUT A\$

40 I\$=SEG\$(A\$,1,1)

50 IF I\$="F" THEN GO TO 250

55 IF I\$="C" THEN GO TO 10

60 X\$=SEG\$(A\$,3,4)+"," +SEG\$(A\$,5,7)

70 X1=VAL(X\$)

75 IF X1>20 THEN X1=X1-100

80 PRINT "ENTER PEAK # ";N

90 INPUT A\$

100 I\$=SEG\$(A\$,1,1)

~~110 IF I\$="F" THEN GO TO 250~~

~~115 IF I\$="C" THEN GO TO 10~~

120 X\$=SEG\$(A\$,3,4)+"," +SEG\$(A\$,5,7)

130 X2=VAL(X\$)

135 IF X2>20 THEN X2=X2-100

140 B1=X2-X1

150 S=B1\*2.54

160 C1=S/500

170 C2=C1\*339.243

180 C3=C1\*1113

190 PRINT \ PRINT

200 PRINT "PEAK", "CENTIMETERS", "SECONDS", "METERS", "FEET"

210 PRINT N,S,C1,C2,C3

220 PRINT \ PRINT

230 N=N+1

240 GO TO 80

250 END

READY

HP-97  
GKILL Program

001	0	00
002	*LBLA	21 11
003	DSP3	-63 07
004	STOA	35 11
005	RCLA	36 11
006	5	05
007	0	00
008	0	00
009	=	-24
010	STOB	35 11
011	RCLB	36 11
012	3	00
013	3	00
014	9	00
015	.	-60
016	2	00
017	4	00
018	3	00
019	0	00
020	6	00
021	x	-30
022	STOC	35 11
023	RCLB	36 11
024	1	00
025	1	00
026	1	00
027	3	00
028	x	-30
029	STOD	35 11
030	RCLA	36 11
031	PRTX	-14
032	RCLB	36 11
033	PRTX	-14
034	RCLC	36 11
035	PRTX	-14
036	RCLD	36 11
037	PRTX	-14
038	R/S	51

00 \*1

Program TI-59  
Gkill

000	76	LBL
001	61	H
002	99	PRT
003	55	=
004	05	5
005	00	0
006	00	0
007	95	=
008	42	STO
009	00	00
010	99	PRT
011	65	*
012	03	3
013	03	3
014	09	9
015	93	.
016	02	2
017	04	4
018	03	3
019	00	0
020	06	6
021	95	=
022	99	PRT
023	43	RCL
024	00	00
025	65	*
026	01	1
027	01	1
028	01	1
029	03	3
030	95	=
031	99	PRT
032	98	ADV
033	98	ADV
034	25	CLF
035	91	F/S
036	00	0
037	00	0
038	00	0
039	00	0
040	00	0

## Transient Analysis:

1. Sound track on channel 8 not useful for analysis since every transient looked almost identical - an envelope of sounds with a large number of peaks within the envelope. This lack of identifying information was probably caused by the AGC system and possibly the microphone.
2. Very little <sup>useful</sup> visual information on channel 8 and it is not continuous throughout the incident.
3. No useful audio or visual information on channel 12.
4. Absolute time is set <sup>both in seconds</sup> from the time of the first slot (Transient 2 on channel 11 video tape).
5. Echo times were computed both digitally and manually and a list was prepared of each gunshot transient waveform listing cm, msec, feet, meters.



①

00109030 EQZ

Transient: 2 on channel 11 (transient not on channel 2)

Video Time: 11:28:12 on channel 11.

Absolute Time: 0.00 second on channel 11.

Visual Information: Blue smoke is seen moving rapidly at about a  $45^\circ$  vertical angle, south and west of the blue Pard lat of a white male wearing a black and white check coat in the center of the screen on the channel 11 video tape. Viewed both real time and slow motion copy ( $1/30$  second takes one second). No useful information noted on channel 2 of what produced the transient. Channels 8 and 11 both reflect that soon after this transient a white male with a handgun is seen sticking out of the passenger side window of vehicle 4.

Aural Information: Using real time and  $1/8$ th speed playback of the high quality tape copy of the channel 11 video tape, a muffled gunshot-like sound is heard with a few sharp echoes following.

Visicorder Information: A transient waveform with the first peak, low in amplitude, but having a fast rise time and a few sharp echoes following. No N-wave present.

Analysis: The transient is a ~~subsonic~~ <sup>probably subsonic</sup> gunshot, due to the fast rise time of the first peak, the aural information, the visual information, and the lack of a precursory N-wave.

The channel 11 microphone location was approximately located by plotting different angles of view immediately before, during and after the impulse. The actual microphone location was then determined during the echo analysis. The microphone was found within  $\pm 3$  feet of 48.75 feet west and 64.69 feet south of the SW corner of 1-5-B APTS, near NE corner of Carver Court and Everett Street, at a distance of 81.00 feet directly from corner to microphone.

Transient: 2 on channel 11

Analysis (continued): The visivideo peaks were then plotted on a 1" to 5' scale map using calibrated rulers, protractors, and various drafting equipment. A large number of locations on the map were calculated before a position was found that agree with the echo times. Usual information was of limited help in locating the muzzle blast location. By plotting echos of the Moving Side House Recreation Bldg, vehicle 11, and other vehicles, it was determined that the gunshot occurred within  $\pm 10$  feet of 192.32 feet west and within  $\pm 3$  feet of 67.42 feet south of the SW corner of 1-S-B APTS, or a distance of 203.84 feet directly from corner to muzzle blast (approximately 4 feet south of the middle of vehicle 11 - yellow bus<sup>3</sup> or very near vehicle 4).

Conclusion: This transient at 11:28:12 on the channel 11 video <sup>likely subsonic</sup> (this is the first recorded gunshot) is a <sup>possibly subsonic</sup> subsonic gunshot, and the muzzle blast occurs at a position 192.32 feet west ( $\pm 10$  feet in the east-west direction) and 67.42 feet south ( $\pm 3$  feet in the north-south direction) of the SW corner of 1-S-B APTS.

②

Transient: 13 on channel 11, 5 on channel 2

Video Time: 11:50:25 on channel 11, 21:57:17 on channel 2

Absolute Time: 22.311 seconds on channel 11

Visual Information: No useful information noted on channels 2 and 11.

Channel 8 shows two white males in the general vicinity of vehicles 11 and 37 reacting to the impulsive sound by looking west and maybe slightly south on Everett Street.

Aural Information: Using real time and  $\frac{1}{2}$ th speed playback of high quality tape copies of the soundtracks of channels 11 and 2, a gunshot-like sound is heard with a very sharp muzzle blast and a series of echos following.

Videographic Information: A transient waveform with <sup>a possible</sup> precursory N-wave is noted with the first peak having a fast rise time and a number of sharp echos (echos mostly on channel 2 recording).

Analysis: The transient is a ~~supersonic~~ <sup>probably supersonic</sup> gunshot, due to the fast rise time of the first peak, the aural information, and the precursory N-wave.

Since the channel 11 recording had few echos, the channel 2 microphone was used for all calculations. The channel 2 was approximately located by plotting different angles of view immediately before, during and after the impulse. The actual microphone location was then determined during the echo analysis. The channel 2 microphone was found within  $\pm 5$  feet of 33.5 feet west and 87.5 feet south of the SW corner of I-S-B APTS, near NE corner of Carver Court and Everett Street, or a distance of 93.89 feet directly from corner to microphone location.

Transient: 13 on channel 11, 5 on channel 2

Analysis: (continued) The visicoder peaks were then plotted on a 1" to 5' scale map using calibrated rulers, protractors, and various drafting equipment. A large number of locations on the map were calculated before a position was found that agreed with the echo times. By plotting echoes off the Morning Side Homes Recreational Building 1-S-B BLDG near vehicle 31, and various vehicles, it was determined that the gunshot occurred within  $\pm 10$  feet of ~~227.06~~ <sup>227.06</sup> feet west and within  $\pm 5$  feet <sup>79.11 feet</sup> south of the SW corner of 1-S-B APTS, or a distance of 240.26 feet directly from corner to muzzle blast. (about 23 feet west of the left rear of vehicle 37)

Conclusion: The transient at 11:50:25 on the channel 11 video <sup>visually superior</sup> (22.311 seconds after first gunshot) is a ~~superior~~ <sup>visually superior</sup> gunshot and the muzzle blast occurs at a position 227.06 feet west ( $\pm 10$  feet in the east-west direction) and 79.11 feet south ( $\pm 5$  feet in the north-south direction) of the SW corner of 1-S-B APTS.

Transient: 15 on channel 11, 7 on channel 2

Video Time: 11:54:28 on channel 11, 22:01:21 on channel 2

Absolute Time: 26.436 seconds on channel 11

Visual Information: No information noted on what produced this transient.

Aural Information: Using real time and 1/8th speed playback of high quality tape copies of the soundtracks of channels 11 and 2, a gunshot like sound is heard with a very sharp muzzle blast and a series of echos following.

Visiometer Information: A transient waveform with the first peak having a fast rise time and a number of sharp echos. <sup>Underpinning of</sup> ~~No~~ N-wave present.

Analysis: The transient is a ~~subsonic~~ <sup>indicated if possible</sup> gunshot, due to the fast rise time of the first peak, the aural information, and the lack of a precursory N-wave.

The channel 11 microphone location was located by using visual information and the echos of 1-5-B BLDG to be within ±5 feet of 41.34 feet west and 113.58 feet south of the SW corner of 1-5-B APTS, near NE corner of Carver Court and Everett Street, at a distance of 120.96 feet directly from corner to microphone location. Channel 2 microphone location not determined as there was no additional, useable info on channel 2.

The visometer peaks were then plotted on a 1" to 5' scale map using calibrated rulers, protractors, and various drafting equipment. A large number of locations were calculated but no definite position could be found due to movement of the video equipment, lack of visual information, and the limited number of echos. The gunshot probably occurred in the rectangle with the south border the middle of Everett Street, the east border is a line extended along the west edge of 1-5-B APTS, the north border along a line extended down the middle of the first sidewalk north of the SW corner of 1-5-B APTS (leading into 1st APTS), and the west border is a line extended along the east edge of the Morning Side Home's Recreational Building. Very slight chance in vicinity of gunshots 1 and 2. Definitely not in vicinity of vehicles 20, 21, 22, 23, 9 and 10.

Transient: 15 on channel 11; 7 on channel 2

Conclusion: This transient at 11:54:28 on the channel 11 video tape (26.436 seconds after first recorded gunshot) is a gunshot, unknown if supersonic, and the missile blast probably occurs in the vicinity of north of the intersection of Everett Street and Carter Court. No exact location could be determined.

(4)

00109030 EQ2

Transient: 17 on channel 11, 8 on channel 2

Video Time: 11:55:20 on channel 11, 22:02:12

Absolute Time: 27.168 seconds on channel 11

Visual Information: No information noted on what produced this transient.

Aural Information: Using real time and  $\frac{1}{8}$ th speed playback of high quality tape copies of the soundtracks of channels 11 and 2, a gunshot-like sound is heard with a very sharp muzzle blast and a series of echoes.

Visualizer Information: A transient waveform with the first peak having a fast rise time and a number of sharp echoes. <sup>possibly</sup> W-wave present.

Analysis: The transient is a ~~concussive~~ <sup>possibly supersonic</sup> gunshot due to the fast rise time of the first peak, the aural information, and the lack of a precursory W-wave.

Rest same as gunshot (3) except <sup>channel 11</sup> microphone position changed to within  $\pm 5$  of 41.44 feet west and 120.28 feet south of the SW corner of I-S-B APTS, near NE corner of Carver Court and Everett Street, at a distance of ~~127.26~~ <sup>127.26</sup> feet directly from corner to microphone location.

~~Conclusion~~  
Conclusion: This transient at 11:55:20 on <sup>the</sup> channel 11 video tape (27.168 seconds after first recorded gunshot) is a gunshot, possibly supersonic, and the muzzle blast probably occurs in the vicinity of north of the intersection of Everett Street and Carver Court. No exact location could be determined.

5

01090-50 24

Transient: 18 on channel 11, 11 on channel 2

Video Time: 12:00:03 on channel 11, 22:06:25 on channel 2

Absolute Time: 31.569 seconds on channel 11

Visual Information: No information noted on what produced this transient.

Aural Information: Using real time and  $\frac{1}{8}$ th speed playback of high quality tape copies of the soundtracks of channel 11 and 2, a gunshot-like sound is heard with a very sharp muzzle blast and a series of echos.

Visicorder Information: A transient waveform with the first peak having a fast rise time and a number of sharp echos. <sup>unknown if supersonic</sup> N-wave: present.

Analysis: The transient is a <sup>unknown if supersonic</sup> successive gunshot, due to the fast rise time of the first peak, the aural information, and the lack of a precursory N-wave.

Save as gunshot ③ except <sup>channel 11</sup> microphone position same as gunshot ⑥.

Conclusion: This transient at 12:00:03 on the channel 11 video tape (31.569 seconds after the first recorded gunshot) is a gunshot, <sup>unknown if supersonic</sup>, and the muzzle blast probably occurs in the vicinity of north of the intersection of Everett Street and Carver Court. No exact location could be determined.



(6)

Transient: 19 on channel 11, 15 on channel 2

Video Time: 12:11:14 on channel 11, 22:18:06 on channel 2

Absolute Time: 42.944 seconds on channel 11

Visual Information: No information noted on what produced this transient.

Aural Information: Using real time and 1/2th speed playback of high quality tape copies of the soundtracks of channels 11 and 2, a gunshot-like sound is heard with a very sharp muzzle blast and a series of echoes.

Visualizer Information: A transient waveform with the first peak having a fast rise time and a number of sharp echoes following. Probable N-wave present.

Analysis: The transient is a gunshot, probably supersonic, due to the fast rise time of the first peak, the aural information, and the probable precursory N-wave.

The channel 11 and channel 2 microphone locations were approximately located by plotting different angles of views immediately before, during and after the gunshot. The actual microphone locations were then determined during the echo analysis, especially using the echo off the building behind the camera locations. The channel 11 microphone was found within  $\pm 3$  feet of 40.35 feet west and 137.21 feet south of the SW corner of 1-5-B APTS, near NE corner of Carver Court and Everett Street, or a distance of 142.81 feet directly from corner to microphone location (approximately  $2\frac{1}{2}$  feet east and 1 foot north of the right rear of vehicle 29). The channel 2 microphone was found within  $\pm 3$  feet of 43.36 feet west and 138.34 feet south of the SW corner of 1-5-B APTS, or a distance of 144.98 feet directly from corner to microphone position (approximately at right rear corner of vehicle 29).

Transient: 19 on channel 11, 15 on channel 2

Analysis (continued): The visicorder peaks were then plotted on a 1" to 5' scale map using calibrated rulers, protractors, and various drafting equipment. A large number of locations on the map were calibrated before a position was found that agreed with the echo times. By plotting echoes off 1-S-B APTS, 1-S-B BLOG behind the cameras, and various vehicles, it was determined that the gunshot occurred within  $\pm 5$  feet of 32.78 feet east and within  $\pm 3$  feet <sup>of 62.25 feet</sup> south of the SW corner of 1-S-B APTS, or a distance of 70.47 feet directly from corner to muzzle blast (about 1 foot SW of the ~~front~~ front corner of vehicle 22).

Probably fired by the ~~other~~ individual firing transit 23 on channel 11.

Conclusion: This transient at 12:11:14 on the channel 11 video tape (42.9<sup>th</sup> records after first recorded gunshot) is a gunshot, probably supersonic, and the muzzle blast occurs at a position ~~32.78~~ 32.78 feet east ( $\pm 5$  feet in the east-west direction) and 62.25 feet south ( $\pm 3$  feet in the north-south direction) of the SW corner of 1-S-B APTS. Probably fired by the individual that fired the gunshot in transit 23 on channel 11.

7

Transient: 20 on channel 11, 16 on channel 2

Video Time: 12:12:02 on channel 11, 22:18:21 on channel 2

Absolute Time: 43.478 on channel 11

Visual Information: No information noted on what produced this transient.

Aural Information: Using real time and 1/8th speed playback of high quality tape copies of the soundtracks of channels 11 and 2, a gunshot-like sound is heard with a very deep muzzle blast and a series of echoes.

Visicorder Information: A transient waveform with the first peak during a fast rise time and a number of sharp echoes following. ~~Unknown~~ if possible N-wave present.

Analysis: The transient is a gunshot, ~~possibly~~ <sup>possibly</sup> supersonic, due to the fast rise time of the first peak and the aural information.

Microphone locations same as in transient 19 on channel 11.

Position of muzzle blast located as in transient 19 on channel 11, but the position has changed slightly. It was determined that the gunshot occurred within  $\pm 5$  feet of 32.19 feet east and within  $\pm 3$  feet of 61.47 feet south of the SW corner of 1-S-B APTS, or a distance of 69.39 feet directly from corner to muzzle blast (about 1 foot west from front right corner of vehicle 22).

Conclusion: This transient at 12:12:02 on channel 11 video tape (43.478 seconds after first recorded gunshot) is a gunshot, ~~possibly~~ <sup>possibly</sup> supersonic, and the muzzle blast occurs at a position 32.19 feet east (within  $\pm 5$  feet in the east-west direction) and 61.47 feet south (within  $\pm 3$  feet in the north-south direction) of the SW corner of the ~~1-S-B APTS~~ 1-S-B APTS.

⑧

Transient: 21 on channel 11, 17 on channel 2

Video Time: 12:12:14 on channel 11, 22:19:09 on channel 2

Absolute Time: 44.097 seconds on channel 11

Visual Information: No information noted re what produced this transient.

Aural Information: Using real time and  $\frac{1}{2}$ th speed playback of high quality tape copies of the soundtracks of channel 11 and 2, a gunshot-like sound is heard with a very sharp muzzle blast and a series of echoes.

Visicorder Information: A transient waveform with the first peak having a fast rise time and a number of sharp echoes following. ~~Underneath~~ if possible N-wave present.

Analysis: Same as transient 20 on channel 11 except probably supersonic.

Conclusion: This transient at 12:12:14 on the channel 11 video tape (44.097 seconds after first recorded gunshot) is a gunshot, ~~and probably~~ <sup>probably</sup> supersonic, and the muzzle blast occurs at a position 32.19 feet east (within  $\pm 5$  feet in the east-west direction) and 61.47 feet south (within  $\pm 3$  feet in the north-south direction) of the SW corner of ~~the~~ of 1-S-B. APTS.

⑨

Transient 22 on channel 11, 18 on channel 2.

Video Time: 12:12:16 on channel 11, 22:19:10 on channel 2

Absolute Time: 44.152 seconds on channel 11.

Visual Information: No information noted on what produced this transient.

Aural Information: Using real time and  $\frac{1}{8}$ th speed playback of high quality tape copies of the soundtracks of channels 11 and 2, a gunshot-like sound is heard with a very sharp muzzle blast and a series of echos.

Vesicular Information: A transient waveform with the first peak having a fast rise time and a number of sharp echos following. Probable N-wave present.

Analysis: Same as transient 19 on channel 11.

Conclusion: This transient at 12:12:16 on the channel 11 video tape (44.152 seconds after first recorded gunshot) is a gunshot, probably supersonic, and the muzzle blast occurs at a position 32.78 feet east ( $\pm 5$  feet in the east-west direction) and 62.25 feet south ( $\pm 3$  feet in the north-south direction) of the SW corner of I-S-B APTS. Probably fired by the individual that fired the gunshot in transient 23 on channel 11.

(10)

Transient: 23 on channel 11, 19 on channel 2

Video Time: 12:13:15 on channel 11, 22:20:14 on channel 2

Absolute Time: 45.240 seconds on channel 11

Visual Information: Channel 11 shows a white male in a white sweater or shirt, dark trousers and bearded firing a shoulder weapon from his right shoulder from NE of the right rear corner of vehicle 9. Channels 2 and 8 had no useful information on what produced the transient.

Aural Information: Using real time and  $\frac{1}{8}$ th speed playback of high quality tape copies of the soundtracks of channels 11 and 2, a gunshot-like sound is heard with a very sharp muzzle blast and a series of echoes. Some movement of video equipment heard on channel 11.

Visiorder Information: A transient waveform with the first peak having a fast rise time and a number of sharp echoes following. Probable N-wave present.

Analysis Same as transient 19 on channel 11 except the gunshot is fired by a white male in a white sweater or shirt, dark trousers, and bearded firing a shoulder weapon from his right shoulder from NE of the right rear corner of vehicle 9; and the position is changed slightly to within  $\pm 5$  feet of 30.25 feet east and within  $\pm 3$  feet of 62.11 feet south of the SW corner of 1-S-B APTS, or a distance of 69.10 feet directly from corner to muzzle blast.

Conclusion: This transient at 12:13:15 on channel 11 video tape (45.240 seconds after first recorded gunshot) is a gunshot, probably supersonic, and the muzzle blast occurs at a position 30.25 feet east ( $\pm 5$  feet in the east-west direction) and 62.11 feet south ( $\pm 3$  feet in the north-south direction) of the SW corner of 1-S-B APTS. This gunshot is fired by the bearded white male in a white sweater or shirt and dark trousers, ~~also~~ with a shoulder weapon on his right shoulder, near the right rear corner of vehicle 9.

(11)

Transient: 25 on channel 11, 20 on channel 2

Video Time: 12:18:00 on channel 11, 22:24:26 on channel 2

Absolute Time: 49.554 seconds on channel 11

Visual Information: Channel 11 shows a white male in a red & white baseball cap <sup>and a light colored top</sup> firing a shoulder weapon from his left shoulder between vehicles 10, 22 and 23. Channels 2 and 8 had no useful information on what produced the transient.

Aural Information: Using real time and  $\frac{1}{4}$ th speed playback of high quality tape copies of the soundtracks of channels 11 and 2, a gunshot-like sound is heard with a very sharp muzzle blast and a series of echoes.

Visicorder Information: A transient waveform with the first peak having a fast rise time and a number of sharp echoes following. N-wave present.

Analysis: The transient is a supersonic gunshot due to the fast rise time <sup>of the first peak</sup>, the aural information, the visual information, and the precursory N-wave.

The microphone very close to the position found on transient 19 on channel 11.

Position located as on transient 19 on channel 11 except the actual position found to be within  $\pm 5$  feet of 38.68 feet east and 59.55 feet south of the SW corner of 1-S-B APTS, or a direct distance from corner to muzzle blast of 70.96 feet.

The shot was fired by the white male in a red & white baseball cap <sup>and a light colored top</sup> firing a shoulder weapon from his left shoulder between vehicles 10, 22 and 23.

Transient: 25 on channel 11, 20 on channel 2

Conclusion: This transient at 12:18:00 on channel 11 video tape (49.554 seconds after first recorded gunshot) is a supersonic gunshot and the muzzle blast occurs at a position 38.68 feet east ( $\pm 5$  feet in the east-west direction) and 59.55 feet south ( $\pm 5$  feet in the north-south direction) of the SW corner of 1-S-B APTS. This gunshot was fired by the white male in a red and white baseball cap, with a shoulder weapon on his left shoulder, near vehicles 10, 22 and 23.



(12)

Transient: 26 on channel 11, 21 on channel 2

Video Time: 12:19:26 on channel 11 video tape, 22:26:19 on channel 2

Absolute Time: 51.409 seconds on channel 11

Visual Information: No information noted on what produced this transient.

Aural Information: Using real time at  $\frac{1}{2}$ th speed playback of high quality tape copies of the soundtracks of channels 11 and 2, a gunshot-like sound is heard with a very sharp muzzle blast and a series of echoes.

Visicorder Information: A transient waveform with the first peak having a fast rise time and a number of sharp echoes. Underscored if supersonic ~~was~~ N-wave is present.

Analysis: The transient is a gunshot, underscored if supersonic, due to the fast rise time of the first peak and aural information.

The microphones are very close to the positions found on transient 19 on channel 11.

The visicorder peaks were then plotted on a 1" to 5' scale map using calibrated rulers, protractors, and various drafting equipment. A large number of locations on the map were calibrated before a position was found that agreed with the echo times. By plotting echoes off the 1-S-B APTS, 1-S-B BLDG behind the canon positions, the corner of the Morning Side Homes Recreational Building, and a number of vehicles, it was determined that the gunshot occurred within  $\pm 5$  feet of ~~215.00~~<sup>13.00</sup> feet west and ~~48.82~~<sup>48.82</sup> feet north of the SW corner of 1-S-B APTS, or a distance of ~~48.82~~<sup>50.44</sup> feet directly from corner to muzzle blast (about 8 feet west from second porch of 1-S-B APTS from SW corner).

This gunshot was probably fired by the white female described on that fire the pistol in transient 31 of channel 11.

Transient: 26 on channel 11, 21 on channel 2

Conclusion: This transient at 12:19:26 on the channel 11 video tape (51.409 seconds after first recorded gunshot) is a gunshot, undrown if supersonic, and the muzzle blast occurs within ~~±~~  $\pm 5$  feet of ~~8m50~~<sup>13.00</sup> feet west and ~~42.00~~<sup>46.82</sup> feet north of the SW corner of 1-S-B APTS. This gunshot was probably fired by the white female seen shooting in transient 31 of channel 11.

Transient: 27 on channel 11, 22 on channel 2

Video Time: 12:20:04 on channel 11, 22:26:25 on channel 2

Absolute Time: 51.681 seconds on channel 11

Visual Information: Channel 2 shows a <sup>bearded</sup> white male in a white sweater or shirt between vehicles 21 and 22 probably slinging a shoulder weapon on his right shoulder. No information noted on channels 8 and 11 on what produced this transient.

Aural Information: Using real time and 1/2th speed playback of high quality tape copies of the soundtracks of channels 11 and 2, a gunshot-like sound is heard with a very sharp muzzle blast and a series of echos.

Visicorder Information: A transient waveform with the first peak having a fast rise time and a number of strong echos. N-wave probably present.

Analysis: The transient is a gunshot, probably supersonic, due to the fast rise time of the first peak, the aural information, the visual information, and the probable N-wave.

The microphone positions are very close to those set forth on transient #9 on channel 11.

The visicorder peaks were then plotted on a 1" to 5' scale using calibrated rulers, protractors, and various drafting equipment. A large number of locations on the map were ~~calibrated~~ <sup>calculated</sup> before a position was found that agreed with the echo times. By plotting echos off 1-S-B APTS, 1-S-B BLDG behind the cameras, and various vehicles, it was determined that the gunshot occurred within  $\pm 3$  feet of 17.08 feet east and 56.20 feet south of the SW corner of 1-S-B APTS, or a distance of 58.66 feet directly from corner to muzzle blast (about 2 feet east of the left front corner of vehicle 21).

This gunshot was fired by the white male described in the visual information.

Transient: 27 on channel 11, 22 on channel 2.

Conclusion: This transient at 12:20:04 on the channel 11 video tape (51.681 seconds after the first recorded gunshot) is a gunshot, probably supersonic, as the muzzle blast occurs within  $\pm 3$  feet of 17.08 feet east and 56.20 feet south of the SW corner of I-S-B APTS. This gunshot was fired by the <sup>perpetrator</sup> white male in the white sweater or shirt with the shoulder weapon between vehicles 21 and 22.

(14)

24

Transient: 29 on channel 11, ~~20 on channel 2~~

Video Time: 12:20:09 on channel 11, 22:27:03 on channel 2

Absolute Time: 51.912 seconds on channel 11

Visual Information: No information noted on what produced this transient.

Aural Information: Using real time and 1/2 speed playback of high quality tape copies of the soundtracks of channels 11 and 2, a gunshot-like sound is heard with a very sharp muzzle blast and a series of echoes.

Visicorder Information: A transient waveform with the first peak having a fast rise time and a number of sharp echoes. Unknown if supersonic N-wave is present.

~~Analysis: Same as transient 26 on channel 11 except the position of the muzzle blast has changed slightly to within 1/2 ft of~~

Analysis: Same as transient 26 on channel 11.

Conclusion: This transient at 12:20:09 on the channel 11 video tape (51.912 seconds after first recorded gunshot) is a gunshot, unknown if supersonic, and the muzzle blast occurs within  $\pm 5$  feet of 13.00 feet west and 48.82 feet north of the SW corner of 1-5-B APTS. This gunshot was probably fired by the white female seen shooting in transient 31 on channel 11.

(15)

Transient: 30 on channel 11, 25 on channel 2

Video Time: 12:20:16 on channel 11, 22:27:15 on channel 2

Absolute Time: 52.263 seconds on channel 11

Visual Information: Channels 8 and 11 show a white male in a blue jacket and trousers firing a handgun in his right hand on the sidewalk near vehicle 19 at the NE corner of Carver Court and Everett Street. Channel 2 contains no information on what produced this transient.

Aural Information: Using real time and  $\frac{1}{8}$ th speed playback of high quality tape copies of the soundtracks of channels 11 and 2, a gunshot-like sound is heard with a very sharp muzzle blast and a limited number of echoes.

Visiorder Information: A transient waveform with the first peak having a fast rise time and a limited number of sharp echoes, <sup>probably erroneous</sup> N-wave present.

Analysis: The transient is a ~~supersonic~~ gunshot <sup>due to the fast</sup> rise time of the first peak, the aural information, the visual information, and the precursory N-wave.

The microphone positions are very close to those set forth on transient 19 on channel 11.

The visiorder peaks were then plotted on a 1" to 5' scale map using calibrated rulers, protractors, and various drafting equipment. A large number of locations on the map were calculated before a position was found that agreed with the echo times. By plotting echoes off I-S-B BLDG behind cameras, the trash can, street signs, posts, and a number of vehicles, it was determined that the gunshot occurred within  $\pm 3$  feet of ~~15.16~~ <sup>15.16</sup> feet west and ~~46.85~~ <sup>46.85</sup> feet south of the SW corner of I-S-B APTS, or a distance of 49.11 feet directly from corner to muzzle blast (on sidewalk near NE corner of Carver Court and Everett Street).

Transient: 30 on channel 11, 25 on channel 2

Conclusion: This transient at 12:20:16 on the channel 11 video tape (52.263 seconds after the first recorded gunshot) is a ~~supersonic~~ gunshot <sup>probably supersonic</sup> and the muzzle blast occurs within  $\pm 3$  feet of 15.16 feet west and 46.85 feet south of the SW corner of 1-S-B APTS. This gunshot was fired by the white male in a blue jacket and trousers with the handgun in his right hand near the <sup>NE</sup> corner of Carter Court and Everett Street.

Transient: 31 on channel 11, 26 on channel 2

Video Time: 12:21:16 on channel 11, 22:28:10 on channel 2

Absolute Time: 53.129 seconds on channel 11

Visual Information: Channel 11 shows a white female in a yellow raincoat firing a handgun in her right hand from the west side of 1-S-B APTS, in the shadow of the building. No information on what produced this transient on channels 2 and 8.

Acoustical Information: Using real time and 1/8th speed playback of high quality tape copies of the soundtracks of channels 11 and 2, a gunshot-like sound is heard with a very sharp muzzle blast and a series of echoes.

Visicorder Information: A transient waveform with the first peak having a fast rise time and a number of sharp echoes. Unknown if supersonic N-wave is present.

Analysis: Same as transient 26 on channel 11 except gunshot is fired by the white female described in the visual information and the position of the muzzle blast is changed slightly to within  $\pm 5$  feet of 8.56 feet west and 46.06 feet north of the SW corner of 1-S-B APTS, or a distance of 46.85 feet directly from corner to muzzle blast (about 4 feet SW from second porch of 1-S-B APTS from SW corner).

Conclusion: This transient at 12:21:16 on the channel 11 video tape (53.129 seconds after first recorded gunshot) is a gunshot, unknown if supersonic, and the muzzle blast occurs within  $\pm 5$  feet of 8.56 feet west and 46.06 feet north of the SW corner of 1-S-B APTS. This gunshot was fired by the white female in a yellow raincoat seen firing a handgun in her right hand from the west side of 1-S-B APTS.



(17)

00109030 E QZ

Transient: 32 on channel 11, 27 on channel 2

Video Time: 12:21:21 on channel 11, 22:28:18 on channel 2

Absolute Time: 53.478 seconds on channel 11

Visual Information: Same as transient 31 on channel 11.

Aural Information: - Same as transient 31 on channel 11.

Visicorder Information: Same as transient 31 on channel 11.

Analysis: Same as transient 31 on channel 11.

Conclusion: This transient at 12:21:21 on the channel 11 video tape (53.478 seconds after first recorded gunshot) is a gunshot, unknown if supersonic, and the muzzle blast occurs within  $\pm 5$  feet of 8.56 feet west and 46.06 feet north of the SW corner of 1-S-B APTS. This gunshot was fired by the white female in a yellow raincoat seen firing a handgun in her right hand from the west side of 1-S-B APTS.

Transient: 33 on channel 11, 28 on channel 2

Video Time: 12:22:10 on channel 11, 22:29:04 on channel 2

Absolute Time: 53.914 seconds on channel 11

Visual Information: Same as transient 31 on channel 11.

Aural Information: Same as transient 31 on channel 11.

Visicorder Information: Same as transient 31 on channel 11.

Analysis: Same as transient 31 on channel 11.

Conclusion: This transient at 12:22:10 on the channel 11 video tape (53.914 seconds after first recorded gunshot) is a gunshot, unknown if supersonic, and the muzzle blast occurs within  $\pm 5$  feet of 8.56 feet west and 46.06 feet north of the SW corner of 1-S-B APTS. This gunshot was fired by the white female in a yellow raincoat seen firing a handgun in her right hand from the west side of 1-S-B APTS.

(19)

Transient: 34 on channel 11, 29 on channel 2

Video Time: 12:22:14 on channel 11, 22:29:10 on channel 2

Absolute Time: 54.124 seconds on channel 11

Visual Information: Channel 11 shows a white male in a blue jacket and trousers firing a handgun in his left hand on the sidewalk near vehicle 19 at the NE corner of Carver Court and Everett Street. Channels 2 and 8 contain no information on what produced this transient.

Aural Information: Using real time and  $\frac{1}{2}$ th speed playback of high quality tape copies of the soundtracks of channels 11 and 2, a gunshot-like sound is heard with a very sharp muzzle blast and a number of echos.

Vocoder Information: A transient waveform with the first peak having a fast rise time and a series of sharp echos. <sup>Probably</sup> N-wave present.

Analysis: The transient is a supersonic gunshot, <sup>probably supersonic</sup> due to the fast rise time of the first peak, the aural information, the visual information, and the <sup>precursor</sup> N-wave.

The microphone positions are very close to those set forth on transient 19 on channel 11.

The rest same as analysis on transient 30 on channel 11 except position of muzzle blast changed slightly to ~~to~~ within  $\pm 3$  of 19.39 feet west and 48.13 feet south of the SW corner of 1-S-B APTS, or a distance of 51.97 feet directly from corner to muzzle blast (on sidewalk near <sup>NE</sup> corner of Carver Court and Everett Street).

Conclusion: This transient at 12:22:14 on channel 11 video tape (54.124 seconds after the first recorded gunshot) is a supersonic gunshot and the muzzle blast occurs within  $\pm 3$  feet of 19.39 feet west and 48.13 feet south of the SW corner of 1-S-B APTS. This gunshot was fired by the white male in a blue jacket and trousers ~~fire~~ with the handgun in his left hand near the NE corner of Carver Court and Everett Street.

(20)

00109030 E QZ

Transient: 35 on channel 11, 30 on channel 2

Video Time: 12:23:26 on channel 11, 22:30:19 on channel 2

Absolute Time: 55.392 seconds on channel 11

Visual Information: No information noted on what produced this transient.

Aural Information: Using real time and  $\frac{1}{8}$ th speed playback of high quality tape copies of the soundtracks of channels 11 and 2, a gunshot-like sound is heard with a muffled muzzle blast and a number of sharp echoes.

Visicorder Information: A transient waveform with the first peak attenuated, but with a fast rise time, and series of sharp echoes. ~~Indication of~~ <sup>possibly</sup> supersonic.

Analysis: The transient is a gunshot, ~~possibly~~ <sup>possibly</sup> supersonic, due to the fast rise time of the first peak and the aural information.

The microphone locations are very close to those set forth on transient 19 on channel 11.

The visicorder peaks were then plotted on a 1" to 5' scale map using calibrated rulers, protractors, and various drafting equipment. A large number of locations on the map were calculated before a position was found that agreed with the echo times. By plotting echoes of 1-S-B APTS, 1-S-B BLDG behind cameras, sign posts, and various vehicles, it was determined that the gunshot occurred within  $\pm 3$  feet of 31.00 feet east and 66.49 feet south of the SW corner of the 1-S-B APTS, or a distance of 73.33 feet directly from corner to muzzle blast (very near right rear corner of vehicle 9).

Conclusion: This transient at 12:23:26 on the channel 11 video tape (55.392 seconds after first gunshot) is a gunshot, ~~possibly~~ <sup>possibly</sup> supersonic, and the muzzle blast occurs at a position within  $\pm 3$  feet of 31.00 feet east and 66.49 feet south of the SW corner of the 1-S-B APTS.

(21)

00109030 E QZ

Transient: 36 on channel 11, 31 on channel 2

Video Time: 12:24:23 on channel 11, 22:31:16 on channel 2

Absolute Time: 56.309 seconds on channel 11

Visual Information: No information noted on what produced this transient.

Aural Information: Using real time and  $\frac{1}{8}$ th speed playback of high quality tape copies of the soundtracks of channels 11 and 2, a relatively low amplitude gunshot-like sound is heard with a very sharp muzzle blast and a series of echoes.

Visicorder Information: A relatively low amplitude transient waveform with the first peak having a fast rise time and a number of sharp echoes. ~~No~~ <sup>unknown</sup> N-wave present.

Analysis: The transient is a ~~subsonic~~ <sup>unknown if supersonic</sup> gunshot due to the fast rise time of the first peak of the aural information, and the lack of a precursory N-wave. Possibly a pistol shot due to the low amplitude.

The channel 11 and channel 2 microphone locations were approximately located by plotting different angles of view immediately before, during and after the impulse. The actual microphone locations were then determined during the echo analysis, especially using the echo off the building behind the camera locations. The channel 11 <sup>microphone</sup> was found within  $\pm 3$  feet of 40.35 feet west and 137.21 feet south of the SW corner of 1-S-B APTS, near NE corner of Carver Court and Everett Street, at a distance of 142.81 feet directly from corner to microphone location (approximately  $2\frac{1}{2}$  feet east and 1 foot north of the right rear of vehicle #29). The channel 2 microphone was found within  $\pm 3$  feet of 43.36 feet west and ~~138.34~~ 138.34 feet south of the SW corner of 1-S-B APTS, at a distance of 144.98 feet directly from corner to microphone position (approximately at right rear corner of vehicle #29).

Transient: 36 on channel 11, 31 on channel 2

Analysis (continued) The visicorder peaks were then plotted on a 1" to 5' scale map using calibrated rulers, protractors, and various drafting equipment. A large number of locations on the map were calculated before a position was found that agreed with the echo times. By plotting echoes off the Morning Side Homes Recreational Building, 1-S-B BLDG behind the cameras, trees, and various vehicles, it was determined that the gunshot occurred within  $\pm 3$  feet of 58.07 feet west and within  $\pm 7$  feet of 13.98 feet north of the SW corner of 1-S-B APTS, on a distance of 59.74 feet directly from corner to muzzle blast (approximately 8 feet from Morning Side Homes Recreational Building).

Conclusion: This transient at 12:24:23 on the channel 11 video tape (56.309 seconds after first gunshot) is a ~~subsonic~~ gunshot, <sup>undrawn in perspective</sup> possibly from a pistol; and the muzzle blast occurs at a position 58.07 feet west ( $\pm 3$  feet in the east-west direction) and 13.98 feet north ( $\pm 7$  feet in the north-south direction) of the SW corner of 1-S-B APTS.

(22)

Transient: 37 on channel 11, 32 on channel 2

Video Time: 12:27:24 on channel 11, 22:34:18 on channel 2

Absolute Time: 59.314 seconds on channel 11

Visual Information: No information noted on what produced this transient.

Aural Information: Using real time at  $\frac{1}{8}$ th speed playback of high quality tape copies of the soundtracks of channels 11 and 2, a gunshot-like sound is heard with a series of sharp echoes.

Videographic Information: A transient waveform with the first peak having a fast rise time and a number of sharp echoes. N-wave present.

Analysis: The transient is a supersonic gunshot due to the fast rise time of the first peak, the aural information, and the precursory N-wave.

Location of camera positions approximately the same as transient 36 on channel 11.

The videographic peaks were then plotted on a 1" to 5' scale map using calibrated rulers, protractors, and various drafting equipment. A large number of locations on the map were calculated before a position was found that agreed with the echo times. By plotting echoes off the I-S-B APTS, the I-S-B BLDG behind the camera, and various vehicles, it was determined that the gunshot occurred within  $\pm 3$  feet of 11.42 feet east and 76.97 feet south of the SW corner of I-S-B APTS, or a distance of ~~77.76~~ 77.76 feet directly from corner to muzzle blast (slightly SW of front left corner of vehicle 9).

The same white male that fired gunshot transient 42 on channel 11 probably fired this shot due to the short time difference, the close proximity of the gunshots, the visual information at transient 42 on channel 11 showing no one else close, and the characteristic N-wave of the weapon.

Transient: 37 on channel 11, 32 on channel 2

Conclusion: This transient at 12:27:24 on the channel 11 video tape (59.314 seconds after first recorded gunshot) is a supersonic gunshot and the muzzle blast occurs at a position within  $\pm 3$  feet of 11.42 feet east and 76.97 feet south of the SW corner of I-S-B APTS. This gunshot is probably fired by the white male described in transient 42 on channel 11.



(23)

Transient: 38 on channel 11, 33 on channel 2

Video Time: 12:28:20 on channel 11, 22:35:12 on channel 2

Absolute Time: 60.178 seconds on channel 11

Visual Information: No information noted on what produced this transient.

Aural Information: Same <sup>as</sup> transient 37 on channel 11.

Visicorder Information: Same <sup>as</sup> transient 37 on channel 11.

Analysis: Same as transient 37 on channel 11

Conclusion: This transient at 12:28:20 on the channel 11 video tape (60.178 seconds after first recorded gunshot) is a supersonic gunshot and the muzzle blast occurs at a position within  $\pm 3$  feet of 11.42 feet east and 76.97 feet south of the SW corner of 1-S-B APTS. This gunshot is probably fired by the white male described in transient 42 on channel 11.

(24)

00109030 E QZ

Transient: 39 on channel 11, 34 on channel 2

Video Time: 12:28:25 on channel 11, 22:35:18 on channel 2

Absolute Time: 60.426 seconds on channel 11

Visual Information: No information noted on what produced this transient.

Aural Information: Using real time and  $\frac{1}{8}$ th speed playback of high quality tape copies of the soundtracks of channel 11 and channel 2, a gunshot-like sound is heard with a very sharp muzzle blast and a series of echoes.

Visicorder Information: A transient waveform with the first peak having a fast rise time and a number of sharp echoes.  
Unknown ~~if~~ N-wave present.

Analysis: The transient is a ~~subsonic~~ <sup>unknown if supersonic</sup> gunshot, "due to the fast rise time of the first peak, the aural information, and the lack of a precursory N-wave."

See transient 36 on channel 11 for location of microphones.

Location of muzzle blast located the same as in transient 36 on channel 11, except position changed somewhat to <sup>within</sup>  $\pm 3$  feet of 58.61 feet west of within  $\pm 5$  feet of 7.68 feet north of the SW corner of 1-S-B APTS, on a distance of 59.10 feet directly from corner to muzzle blast (approximately 7 feet from Moving Side Homes Recreational Building).

Conclusion: This transient at 12:28:25 on <sup>the</sup> channel 11 video tape (60.426 seconds after first gunshot) is a ~~subsonic~~ <sup>unknown if supersonic</sup> gunshot, and the muzzle blast occurs at a position 58.61 feet west ( $\pm 3$  feet in the east-west direction) and 7.68 feet north ( $\pm 5$  feet in the north-south direction) of the SW corner of 1-S-B APTS.

(25)

Transient 40 on channel 11 (Transient 35 on channel 2)

Video Time: 12:30:05 on channel 11, 22:36:28 on channel 2

Absolute Time: 61.702 seconds on channel 11

Visual Information: No information noted on what produced this transient.

Aural Information: Using real time and 2x speed playback of high quality tape copies of the soundtracks of channels 11 and 2, a gunshot-like sound is heard with a very sharp muzzle blast and a series of echoes.

Visicorder Information: A transient waveform with the first peak having a fast rise time and a <sup>large</sup> number of sharp echoes. Probable N-wave present.

Analysis: This transient is a gunshot, probably supersonic, due to the fast rise time of the first peak, the aural information, and the probable precursory N-wave.

See transient 36 on channel 11 for locations of microphones.

The visicorder peaks were then plotted on a 1" to 5' scale map using calibrated rulers, protractors, and various drafting equipment. A large number of locations on the map were calculated before a position was found that agreed with the echo times. By plotting echoes of 1-S-B APTS, 1-S-B BLOC behind cameras, a tree, and various vehicles, it was determined that the shot occurred within  $\pm 3$  feet of 1.68 feet west of 62.40 feet south of the SW corner of 1-S-B APTS, or a distance of 62.40 feet directly from corner to muzzle blast (about 2 feet west of the right front corner of vehicle 20).

This gunshot was fired by a white male in a red flannel-like shirt and blue jeans who is poorly seen in that location at 12:30:08 on channel 11. A better view of him is seen a few seconds earlier on channel 11.

Transient: 40 on channel 11, 35 on channel 2

) Conclusion: This transient at 12:30:05 on the channel 11 video tape (61.702 seconds after first recorded gunshot) is a gunshot, probably supersonic, and the muzzle blast occurs at a position within  $\pm 3$  feet of 1.18 feet west and 62.40 feet south of the SW corner of 1-S-B APTS. This gunshot was fired by a white male in a red flannel-like shirt and blue jeans who is poorly seen at 12:30:08<sup>on channel 11</sup>. A better view of him is seen a few seconds earlier on channel 11.

(26)

00109030 EQZ

Transient: 41 on channel 11, 36 on channel 2

Video Time: 12:30:17 on channel 11, 22:37:05 on channel 2

Absolute Time: 62.056 seconds on channel 11

Visual Information: No information noted on what produced this transient.

Aural Information: Using real time and 1/2th speed playback of high quality tape copies of the soundtracks of channels 11 and 2, a gunshot-like sound is heard with a very sharp muzzle blast and a series of echos.

Visicorder Information: A transient waveform with the first peak having a fast rise time and a number of sharp echos. N-wave present

Analysis: Same as transient 37 on channel 11 except the white male described in Transient 42 on channel 11 fired this gunshot due to the very short time difference, the same position of the muzzle blast, the visual information on transient 42 on channel showing no one else close to the slotted, and the characteristic N-wave; also the position is changed slightly to within  $\pm 3$  feet of 13.09 feet east and 75.20 feet south of the SW corner of 1-S-B APTS, or a distance of 76.57 feet directly from corner to muzzle blast (near left front corner of vehicle 9).

Conclusion: This transient at 12:30:17 on the channel 11 video tape (62.056 seconds after first recorded gunshot) is a supersonic gunshot and the muzzle blast occurs at a position within  $\pm 3$  feet of 13.09 feet east and 75.20 feet south of the SW corner of 1-S-B APTS. This gunshot is fired by the white male described in transient 42 on channel 11.

(2)

Transient: 42 on channel 11, Transient 37 on channel 2

Video Time: 12:31:00 on channel 11, 22:37:29 on channel 2

Absolute Time: 62.751 seconds on channel 11

Visual Information: Channels 2 and 11 show a white male with shoulder length hair, tall, large frame in a blue-jean outfit firing a shoulder weapon with a banana clip on his right shoulder next to left front corner of vehicle 9.

Aural Information: Using real time at  $\frac{1}{8}$ th speed playback of high quality tape copies of the soundtracks of channels 11 and 2, a gunshot-like sound is heard with a very sharp muzzle blast and a series of echoes.

Visicorder Information: A transient waveform with the first peak having a fast rise time and a number of sharp echoes. N-wave present.

Analysis: Same as transient 37 on channel 11 except the white male described in the visual information above fired this gunshot, and the position is changed slightly to within  $\pm 3$  feet of 13.09 feet east and 75.20 feet south of the SW corner of the 1-S-B APTS, or a distance of 76.57 feet directly from corner to muzzle blast (near left front corner of vehicle 9).

Conclusion: This transient at 12:31:00 on the channel 11 video tape (62.751 seconds after first recorded gunshot) is a supersonic gunshot and the muzzle blast occurs at a position within  $\pm 3$  feet of 13.09 feet east and 75.20 feet south of the SW corner of 1-S-B APTS. This gunshot is fired by the white male with shoulder length hair, tall, large frame in a blue-jean outfit seen with shoulder weapon with a banana clip on his right shoulder next to left front corner of vehicle 9.

Transient: 43 on channel 11, transient 38 on channel 2.

Video Time: 12:31:17 on channel 11, 22:38:09 on channel 2.

Absolute Time: 63.071 seconds on channel 11

Visual Information: No information noted on what produced this transient.

Aural Information: Using real time and 1/8th speed playback of high quality tape copies of the soundtracks of channels 11 and 2, a gunshot-like sound is heard with a very sharp muzzle blast and a series of echoes.

Vicicorder Information: A transient waveform with the first peak showing a fast rise time and a number of sharp echoes. Unknown if supersonic.

Analysis: This transient is a gunshot, unknown if supersonic, due to the fast rise time of the first peak and the aural information.

Microphone locations approximately same position as in transient 36 on channel 11.

The vicicorder peaks were then plotted on a 1" to 5' scale map using calibrated rulers, protractors, and various drafting equipment. A large number of locations on the map were calculated before a position was found that agreed with the echo times. By plotting echoes off 1-S-B APTS, 1-S-B BLDG behind the camera, 9<sup>th</sup> tree, and various vehicles, it was determined that the gunshot occurred within  $\pm 3$  feet of ~~the~~ 1.18 feet east and 61.22 feet south of the SW corner of 1-S-B APTS, or a distance of 61.22 feet directly from corner to muzzle blast (very near right center front edge of vehicle 20).

Probably fired by white male in red flannel-like shirt and blue jeans who is first seen at 12:30:08<sup>on channel 11</sup>. A better view of him is seen a few seconds earlier on channel 11.

Transient: 43 on channel 11, 38 on channel 2

Conclusion: This transient at 12:31:17 on the channel 11 video tape (63.071 seconds after first recorded gunshot) is a gunshot, unknown if supersonic, as the muzzle blast occurs <sup>within 1/3 foot</sup> of 1.18 feet east and 61.22 feet south of the SW corner of 1-3-B APTS. This gunshot was probably fired by a white male in a red flannel-like shirt and blue jeans who is poorly seen at 12:30:08 on channel 11. A better view of him is seen a few seconds earlier on channel 11.



(29)

Transient: 44 on channel 11, 39 on channel 2

Video Time: 12:31:28 on channel 11, 22:38:17 on channel 2

Absolute Time: 63.361 seconds on channel 11

Visual Information: No information noted on what produced this transient.

Aural Information: Using real time and 1/2th speed playback of high quality tape copies of the soundtracks of channels 11 and 2, a very low amplitude gunshot-like sound is heard with a very sharp muzzle blast and a series of echoes.

Visiorder Information: A very low amplitude transient waveform with the first peak having a fast rise time and a number of sharp edges. ~~No~~ N-wave present.

Analysis: This transient is a ~~subsonic~~ <sup>unknown if supersonic</sup> gunshot due to the fast rise time of the first peak, the aural information, and the lack of known of a precursory N-wave. Possibly a pistol shot due to low amplitude.

See transient 36 on channel 11 for location of microphones.

Location of muzzle blast located the same as in transient 36 on channel 11, except position changed slightly to <sup>within</sup>  $\pm 3$  feet of 59.65 feet west and within  $\pm 5$  feet of 8.91 feet north of the SW corner of I-S-B APTS, or a distance of 60.29 feet directly from corner to muzzle blast (approximately 70 feet from Morning Side Homes Recreational Building). Characteristics of this gunshot resemble transient 36 on channel.

Conclusion: This transient at 12:31:28 on the channel 11 video tape <sup>unknown if supersonic</sup> (63.361 seconds after first gunshot) is a ~~subsonic~~ <sup>unknown if supersonic</sup> gunshot, possibly from a pistol, and the muzzle blast occurs at a position 59.65 feet west ( $\pm 3$  feet <sup>3</sup> in the east-west direction) and 8.91 feet north ( $\pm 5$  feet in the north-south direction) of the SW corner of I-S-B APTS. This gunshot may have been fired from the same weapon as transient 36 on channel 11.

(30)

00109030 EQC

Transient: 45 on channel 11, 40 on channel 2

Video Time: 12:33:13 on channel 11, 22:40:03 on channel 2

Absolute Time: 64.899 seconds on channel 11

Visual Information: No information noted on what produced this transient.

Aural Information: Using real time and 1/8th speed playback of high quality tape copies of the soundtracks of channels 11 and 2, a relatively low amplitude gunshot-like sound is heard with a very sharp muzzle blast and a series of echos.

Visicorder Information: A low amplitude transient waveform with the first peak having a fast rise time and a number of sharp echos. Unknown ~~if~~ N-wave present.

Analysis: Same as transient 44 on channel 11.

Conclusion: This transient at 12:33:13 on the channel 11 video tape (64.899 seconds after first gunshot) is a ~~subsonic~~ <sup>subsonic or supersonic</sup> gunshot, possibly from a pistol, and the muzzle blast occurs at a position 59.65 feet west ( $\pm 3$  feet in the east-west direction) and 8.91 feet north ( $\pm 5$  feet in the north-south direction) of the SW corner of I-S-B APTS. This gunshot may have been fired from the same weapon as transients 36 and 44 on channel 11.

(31)

Transient: 46 on channel 11, 41 on channel 2

Video Time: 12:33:26 on channel 11, 22:40:25 on channel 2

Absolute Time: 65.644 seconds on channel 11

Visual Information: Channel 11 shows an unidentified individual firing a weapon behind the right side of vehicle 10. Channels 2 and 8 have no information on what produced this transient.

Aural Information: Using real time and 1/2th speed playback of high quality tape copies of the soundtracks of channels 11 and 2, a gunshot-like sound is heard with a low amplitude, but sharp, muzzle blast and a series of echoes.

Visicorder Information: A transient waveform with a low amplitude first peak but with a fast rise time and a number of sharp echoes. Unknown if supersonic.

Analysis: This transient is a gunshot, unknown if supersonic, due to the fast rise time of the first peak, the visual information of the aural information. The N-wave may have been blocked by vehicle 10.

Microphone locations approximately same position as in transient 36 on channel 11.

The visicorder peaks were then plotted on a 1" to 5' scale map using calibrated rulers, protractors, and various drafting equipment. A large number of locations on the map were calculated before a position was found that agreed with the echo times. By plotting echoes off 1-S-B APTS, 1-S-B BLDG behind camera and various vehicles, it was determined that the gunshot occurred within  $\pm 3$  feet of 45.57 feet east and 61.61 feet south of the SW corner of 1-S-B APTS, at a distance of 76.57 feet directly from corner to muzzle blast (near right rear corner of vehicle 23).

This gunshot <sup>was</sup> fired by unidentified individual <sup>just north of</sup> behind the right side of vehicle 10.

Transient: 46 on channel 11, 41 on channel 2.

Conclusion: This transient at 12:33:26 on <sup>the</sup> channel 11 video tape (65.644 seconds after first recorded gunshot) is a gunshot, unknown if supersonic, and the muzzle blast occurs within  $\pm 3$  of 45.57 feet east and 61.61 feet south of the SW corner of I-S-B APTS. This gunshot is fired by an unidentified individual just north of the right side of vehicle-10.

32

Transient: 47 on channel 11, 42 on channel 2

Video Time: 12:35:06 on channel 11, 22:41:29 on channel 2

Absolute Time: 66.724 seconds on channel 11

Visual Information: No information noted on what produced this transient.

Aural Information: Using real-time and 1/8th speed playback of high quality tape copies of the soundtracks of channels 11 and 2, a relatively low amplitude gunshot-like sound is heard with a very sharp muzzle blast and a series of echoes.

Visicorder Information: A low amplitude transient waveform with the first peak having a fast rise time and a number of sharp echoes. Unknown if ~~the~~ N-wave present.

Analysis: Same as transient 44 on channel 11

Conclusion: This transient at 12:35:06 on channel 11 video tape (66.724 seconds after first gunshot) is a ~~subsonic~~ <sup>unknown if supersonic</sup> gunshot, possibly from a pistol, and the muzzle blast occurs at a position 59.65 feet west ( $\pm 3$  feet in the east-west direction) and 8.91 feet north ( $\pm 5$  feet in the north-south direction) of the SW corner of 1-S-B APTS. This gunshot may have been fired from the same weapon as transients 36, 44 and 45 on channel 11.

Transient: 48 on channel 11, 43 on channel 2

Video Time: 12:36:03 on channel 11, 22:42:29 on channel 2

Absolute Time: 67.758 seconds on channel 11

Visual Information: No information noted on what produced this transient.

Aural Information: Using real time and 1/8th speed playback of high quality tape copies of the soundtracks of channels 11 and 2, a gunshot-like sound is heard with a very sharp muzzle blast and series of echos.

Visicorder Information: A transient waveform with a slightly attenuated first peak having a fast rise time and a number of sharp echos. Possible N-wave present.

Analysis: This transient is a <sup>possibly supersonic</sup> supersonic gunshot due to the fast rise time of the first peak, the aural information, and the N-wave.

Microphone locations approximately same position as in transient 36 on channel 11.

The visicorder peaks were then plotted on a 1" to 5' scale map using calibrated rulers, protractors, and various drafting equipment. A large number of locations on the map were calculated before a position was found that agreed with the echo times. By plotting echos off 1-S-B APTS, 1-S-B BLDG. behind the cameras and various vehicles, it was determined that the gunshot occurred within  $\pm 7$  feet of 40.35 feet east and  $\pm 3$  feet of 57.09 feet south of the SW corner of 1-S-B APTS, or a distance of 69.88 feet directly from corner to muzzle blast (between vehicles 22 and 23).

Since the channel 2 and 11 video tapes do not show the gunshot, even though the camera are pointed in that direction, the gunshot must have been fired below the raised trunk lid on vehicle 9.

Transient: 48 on channel 11, 43 on channel 2

Conclusion: This transient at 12:36:03 on the channel 11 video tape  
(67.758 seconds after first recorded gunshot) is a supersonic gunshot, possibly  
supersonic as the muzzle blast occurs within  $\pm 7$  feet of 40.35 feet east  
and within  $\pm 3$  feet of 57.09 feet south of the SW corner of  
1-S-B APTS.

Transient: 49 on channel 11, 44 on channel 2

Video Time: 12:36:15 on channel 11, 22:43:05 on channel 2

Absolute Time: 68.010 seconds on channel 11

Visual Information: No information noted on what produced this transient.

Aural Information: Using real time and 1/8th speed playback of high quality tape copies of the soundtracks of channels 11 and 2, a relatively low amplitude gunshot-like sound is heard with a very sharp muzzle blast and a series of echoes.

Visicorder Information: A low amplitude transient waveform with the first peak having a fast rise time and a number of sharp echoes. <sup>1/20</sup> N-wave present.

Analysis: Same as transient 44 on channel 11.

Conclusion: This transient at 12:36:15 on the channel 11 video tape (68.010 seconds after first gunshot) is a subsonic gunshot <sup>unknown of distance</sup> possibly from a pistol, as the muzzle blast occurs at a position 59.65 feet west ( $\pm 3$  feet in the east-west direction) and 8.91 feet north ( $\pm 5$  feet in the north-south direction) of the SW corner of T-5-B APTS. This gunshot may have been fired from the same weapon as transients 36, 44, 45 and 47.



Transient 50 on channel 11, 46 on channel 2

Video Time: 12:45:06 on channel 11, 22:51:27 on channel 2

Absolute Time: 76.703 seconds on channel 11

Visual Information: No information on what produced this transient except fragments seen flying off vehicle 15 on the channel 2 video tape.

Aural Information: Using real time and 1/8th speed playback of high quality tape copies of the soundtracks of channels 11 and 2, a gunshot-like sound is heard with a very sharp muzzle blast and a series of echoes.

Vesicorder Information: A transient waveform with the first peak having a fast rise time and a number of sharp echoes following. N-wave present.

Analysis: The transient is a supersonic gunshot due to the fast rise time of the first peak, the aural information, the visual information, and the precursory N-wave.

The microphone locations approximately at same position as in transient 36 on channel 11.

~~Muzzle blast~~  
~~Location~~

Muzzle blast located as on transient 25 on channel 11 except the actual position slightly changed to be within  $\pm 5$  feet of 38.68 feet east and 61.05 feet south of the SW corner of 1-S-B APTS, or a direct distance from corner to muzzle blast of 73.30 feet (between vehicle 10, 22 and 23).

Due to the characteristic N-wave and close proximity of the slots, transient 25 ~~is~~ probably was fired from the same weapon.

Transient: 50 on channel 11, 46 on channel 2.

Conclusion: This transient at 12:45:06 on the channel 11 video tape (76.703 seconds after first recorded gunshot) is a supersonic gunshot as the muzzle blast occurs at a position ~~38.68~~ within  $\pm 5$  feet of 38.68 feet east and 61.05 feet south of the SW corner of 1-S-B APTS. The gunshot was probably fired from the same weapon as transient 25 on ~~the~~ channel 11.

(36)

Transient: 51 on channel 11, 47 on channel 2

Video Time: 12:51:23 on channel 11, 22:58:14 on channel 2

Absolute Time: 83.275 seconds on channel 11

Visual Information: No information noted on what produced this transient.

Aural Information: Using real time and  $\frac{1}{8}$ th speed playback of high quality tape copies of the soundtracks of channel 11 and channel 2, a gunshot-like sound is heard with a very sharp muzzle blast and a series of echoes.

Visicorder Information: A transient waveform with the first peak having a fast rise time and a number of sharp echoes.  
~~Unknown~~ <sup>if</sup> N-wave present.

Analysis: The transient is a ~~subsonic~~ <sup>unknown if supersonic</sup> gunshot, due to the fast rise time of the first peak, the aural information, and the lack of a precursory N-wave.

See transient 36 on channel 11 for location of microphones.

Location of muzzle blast located the same as transient 36 on channel 11, except position changed slightly to within  $\pm 3$  feet of 59.65 feet west and  $\pm 5$  feet of 9.45 feet north of the SW corner of 1-S-B APTS, or a distance of 60.33 feet directly from corner to muzzle blast (approximately 6 feet from Moving Side Homes Recreational Building). Very similar to transient 39 on channel 11.

Conclusion: This transient at 12:51:23 on <sup>the</sup> channel 11 video tape (83.275 seconds after first gunshot) is a ~~subsonic~~ <sup>unknown if supersonic</sup> gunshot and the muzzle blast occurs at a position 59.65 feet west ( $\pm 3$  feet in the east-west direction) and 9.45 feet north ( $\pm 5$  feet in the north-south direction) of the SW corner of 1-S-B APTS. This gunshot may have been fired from the same weapon as transient 39 on channel 11.

(31)

Transient: 52 on channel 11, 49 on channel 2

Video Time: 12:55:03 on channel 11, 23:01:25 on channel 2

Absolute Time: 86.652 seconds on channel 11

Visual Information: No information noted on what produced this transient.

Audial Information: Same as transient 51 on channel 11

Visicorder Information: Same as transient 51 on channel 11

Analysis: Same as transient 51 on channel 11

Conclusion: This transient at 12:55:03 on the channel 11 video tape <sup>of sequence</sup> (86.652 seconds after first gunshot) is a ~~subsonic~~ <sup>subsonic</sup> gunshot, and the muzzle blast occurs at a position 59.65 feet west ( $\pm 3$  feet in the east-west direction) and 9.45 feet north ( $\pm 5$  feet in the north-south direction) of the SW corner of 1-S-B APTS. This gunshot may have been fired from the same weapon as transients 39 and 51 on channel 11.

Transient: 53 on channel 11, 50 on channel 2

Video Time: 12:55:21 on channel 11, 23:02:14 on channel 2

Absolute Time: 87.268 seconds on channel 11

Visual Information: No information noted on what produced this transient.

Aural Information: Using real time at 1/8th speed playback of high quality tape copies of the soundtracks of channels 11 and 2, a gunshot-like sound is heard which distorts the recording systems. Sounds very close to microphones.

Vesicular Information: A transient waveform with the first peak having a fast rise time and then the rest of the waveform is distorted. Unknown if supersonic.

Analysis: The transient is ~~at least one~~ <sup>possibly two</sup> gunshot(s) very close to the microphones based on the fast rise time of the first peak of the aural information. Unknown if supersonic.

Based on the aural information the gunshot(s) occurred in the vicinity of the microphones, possibly at 49.41 feet ~~west~~ <sup>west</sup> and 138.09 feet south of the SW corner of 1-S-B APTS, or a direct distance of 146.66 feet from corner to muzzle blast (near left rear corner of vehicle 29. Exact site unknown.

Microphone locations approximately the same as transient 36 on channel 11.

Conclusion This transient at 12:55:21 on the channel 11 video tape (87.268 seconds after the first recorded gunshot) is a ~~gunshot~~ <sup>or two gunshots</sup>, unknown if supersonic, as the muzzle blast possibly occurs at 49.41 feet ~~west~~ <sup>west</sup> and 138.09 feet south of the SW corner of 1-S-B APTS.

Transient: 54 on channel 11, 51 on channel 2

Video Time: 12:56:23 on channel 11, 23:03:16 on channel 2

Absolute Time: 88.342 seconds on channel 11

Visual Information: No information noted on what produced this transient.

Aural Information: Using real time and 1/2th speed playback of high quality tape copies of the soundtracks of channels 11 and 2, a gunshot-like sound is heard with a very sharp muzzle blast and a series of echoes.

Videographic Information: A transient waveform with the first peak having a fast rise time and a number of sharp echoes. N wave present.

Analysis: The transient is a supersonic gunshot due to the fast rise time of the first peak, the aural information, and the necessary N-wave.

Microphone locations approximately the same as transient 36 on channel 11.

Videographic peaks were plotted as on transient 48 on channel 11 except position changed slightly to within  $\pm 7$  feet of 40.40 feet east and to within  $\pm 3$  feet of 57.38 feet south of the SW corner of 1-S-B APTS, or a distance of 69.98 feet directly from corner to muzzle blast (between vehicles 22 and 23).

Conclusion: This transient at 12:56:23 on the channel 11 video tape (88.342 seconds after the first recorded gunshot) is a supersonic gunshot and the muzzle blast occurs within  $\pm 7$  feet east of 40.40 feet east and ~~57.38~~ within  $\pm 3$  feet of 57.38 feet south of the SW corner of 1-S-B APTS.

FBI  
TECHNICAL SERVICES DIVISION  
FEDERAL BUREAU OF INVESTIGATION  
WASHINGTON, D. C. 20535

① - Mr. Castaneda  
1 - File (1B046)

To: SAC, Charlotte (44-3527)

June 8, 1980

From: Director, FBI

FBI FILE NO. 44-81521

LAB. NO. 00107007 E RD

Re: GREENKIL

Examination requested by: SAC, Charlotte  
Reference: Evidence receipt dated 1/7/80  
Examination requested: Video Tape  
Remarks:

Enclosures (2) (2 Technical Services Division Reports)

CEC/amb\*  
(7)

ADMINISTRATIVE PAGE

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FBI  
TECHNICAL SERVICES DIVISION  
FEDERAL BUREAU OF INVESTIGATION  
WASHINGTON, D. C. 20535

1 - Mr. Castaneda  
1 - File (1B046)

To: SAC, Charlotte (44-3527)

July 8, 1980

From: Director, FBI

FBI FILE NO. 44-81521

LAB. NO. 00109030 E RD

Re: GREENKIL

Examination requested by:

SAC, Charlotte

Reference:

Evidence receipt dated 1/9/80

Examination requested:

Videotape

Remarks:

Enclosures (2) (2 Technical Services Division Reports)

CEC/amb\*  
(5)

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SAC, Charlotte (44-3527)

June 8, 1980

On 1/17/80, a copy of Q407, Q408 and Q409 containing time code and channel character was reproduced in a slow motion mode on two 3/4" videotape cassettes, each designated by number.

On 1/28/80, copy #1 (slow motion mode) was forwarded to SA [redacted] Greensboro Resident Agency, North Carolina, via registered mail. Copy #2 was retained at Technical Services Division, FBIHQ.

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b7c

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44-81521  
00109030 E RD